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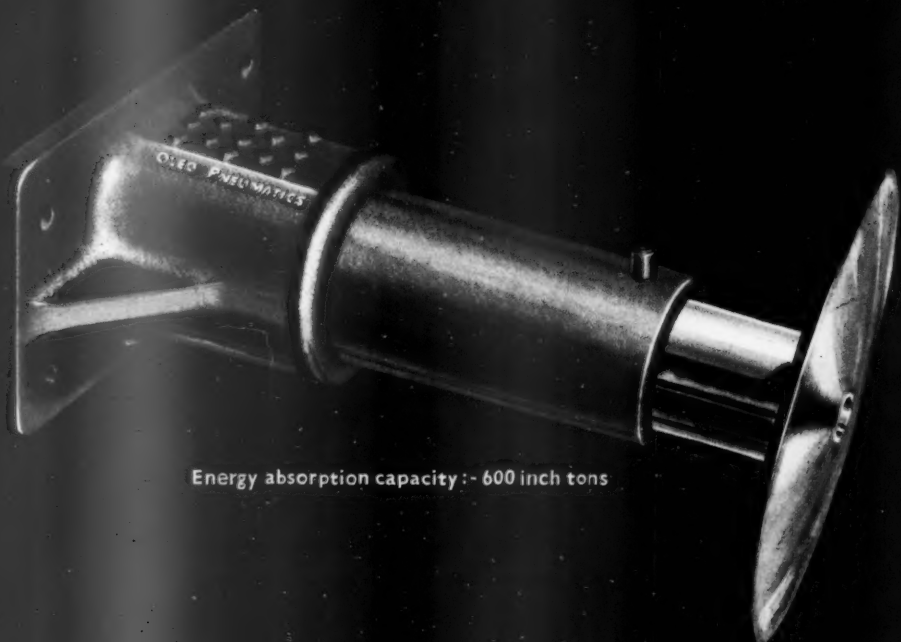
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Railway Redundancy

AT time of going to press, it was understood that a redundancy agreement covering railway workshop staff had been accepted by the British Transport Commission, and that final agreement would be made on April 15. As understood, dismissed shopmen will be compensated on a length-of-service basis. To qualify for compensation, a man must have served at least three years. He then becomes entitled to a bulk payment of two-thirds his rate of pay (less unemployment benefit) for a fortnight after dismissal through redundancy. The payment will be made even if he immediately gets another job: if he does not, he will receive two more weekly payments at the same rate. A man with 40 years of service will receive a similarly-calculated bulk payment based on 13 weeks' work, after which period, if still unemployed, he will receive weekly payments for another 13 weeks. The engineering unions are understood to consider the agreement to have established the principle that a redundant worker has a right to compensation regardless of how quickly he can find other work. Whether or not this is so, it is certain to have its effect on redundancy schemes relating to sections of private industry. The scheme

will be costly. A circular sent to N.U.R. branches last week made it clear that the union is not prepared to give full support to the Commission's efforts to find finance for this and other developments. It refers to "economies . . . under the guise of modernisation," and states that "arising from modernisation, no additional or changed work should be performed prior to any required adjustments in rates of pay or incentives." Commenting, the *Railway Review* says that, while the union supports the modernisation plan, no agreement exists between Commission and union to effect "sweeping economies." London busmen are pricing bus services out of the market; railwaymen need not think themselves immune from the same result. Around large centres of population every increase in passenger fares results in many travellers adopting other forms of transport. The effect is a drop in passenger revenue indistinguishable from that increasingly experienced by London Transport.

Sir Gilmour Jenkins

SIR GILMOUR JENKINS, Permanent Secretary to the Ministry of Transport and Civil Aviation, whose retirement, at the end of last month, was recorded in our February 20 issue, had completed 40 years' continuous Government service. The appointment which he has just relinquished requires an intimate knowledge of all forms of transport. Sir Gilmour Jenkins displayed a remarkable versatility in performing these duties, for much of his earlier career had been restricted to shipping matters only. Yet when, in 1947, he became Permanent Secretary to the Ministry of Transport he quickly proved his ability in facing problems in a far wider field. Six years later, when the department was merged with the Ministry of Civil Aviation, he showed equal aptitude, as Permanent Secretary to the combined Ministry which embraced all forms of transport. Sir Gilmour Jenkins has played a prominent part in the affairs of the Institute of Transport. Only three years after becoming a member of that body, he was an Additional Ordinary Member of Council; and three years later he was made its President.

Developments in Brazil

NEW construction, re-alignment and electrification of the Brazilian National Railways continue to progress. Lines opened to traffic during the past year include that of the metre-gauge Eastern Railways (Leste Brasileiro) from Cruz das Almas to Conceicao de Almeida. This is the penultimate link needed to connect the Leste Brasileiro with the Nazare Railway, also metre gauge, and the river port of Sao Roque, whence the mineral exports from the State of Bahia will be shipped. Part of a loan from U.S.A. is to be used for a new railway between Passo Fundo und General Luz, in Rio Grande do Sul. Electrification works included conversion of nearly 30 more miles of the Leste Brasileiro to Conceicao da Feira and of the Mineira system between Angra dos Reis and Barra Mansa. The last of the re-alignments was completed on the Sertao line, designed to facilitate running of iron ore trains from Minas Gerais to the coast for export. Extensive re-laying of track was carried out. In an expanding economy demands on the railways are expected to increase rapidly, and many more extensions and improvements are believed to be planned.

Further Electrification in South India

ELECTRIFICATION of the metre-gauge main line of the former South Indian Railway, now part of the Southern Railway, southwards from Tambaram, terminus of the Madras suburban electric trains, has been considered for some time. Tambaram is some 16 miles from Madras Beach terminus, and conversion was envisaged of a further 19 miles of route to Chingleput, and possibly onwards to the junction at Villupuram, 99 miles from Madras. There are two tracks electrified at 1,500-V. d.c. from Madras Beach to Madras Egmore, whence a third track, worked as a single line for steam main-line passenger and goods trains, accompanies the electrified tracks to Tambaram, beyond which the line is single. The Government of India has now decided to electrify the Tambaram-Chingleput section at 25 kV. a.c. and to double it; and to lay between Madras and Chingleput an additional track which is to be suitable for both a.c. and d.c. traction.

Dual-Voltage Electric Locomotives

THE Chief Electrical Engineer of the Southern Railway of India has informed the United Kingdom Trade Commissioner in Madras that implementation of the scheme will necessitate complete overhead equipment for both sections to be electrified; between six and ten dual-voltage electric locomotives; and equipment for one 25-kV. a.c. single-phase traction sub-station. No technical consultants have been employed, but it is stated that if any are required the Railway Board will probably approach the French National Railways, which have been consulted by the Board in connection with a.c. electrification of the Eastern and South Eastern Railways. The purpose of electrification to Villupuram, when first mooted, was stated to be the greater throughput of traffic, and especially goods, made possible by higher running speeds. The fact that dual-voltage locomotives only are required, and that certain sidings are to be electrified, seems to imply that main-line passenger and goods trains only are to be worked at 25-kV., unless, at a later date, the 1,500-V. suburban service is converted to a.c.

Reduced Traffic in the Belgian Congo

THE closing of the 58-mile 3 ft. 6 in. gauge Kivu Railway in the east of the Belgian Congo and its replacement by a road service has removed what was thought by some people to be a potential link in a future north-to-south railway through Africa. If a Cape-to-Cairo, or a Cape-to-Kenya, line is ever built, the route seems more likely to be east of the Great Lakes, through Tanganyika. Meanwhile the economic recession and civil disturbance in the Congo have caused a decline in traffic on the Otraco (Office d'Exploitation des Transports Coloniaux) railways. Passenger services have been withdrawn on the 85-mile, 2-ft. gauge Mayumbe Railway. On its busy 3 ft. 6 in. gauge Matadi-Leopoldville Railway, the Otraco management has installed C.T.C. over some 50 miles. The future of this line is bright, especially if it is extended eastwards to link up with the Bas Congo-Katanga Railway, affording through-running between the port of Matadi, the Katanga region, Rhodesia, and the Cape.

Eastern Region News

ONE of the several ways in which railwaymen are being kept in touch with developments in their industry is by the publication of *Eastern Region News*, a monthly four-page newspaper, published in three editions for the three main lines of the Eastern Region of British Railways. It has been running for a year. In a recent issue, although attention is drawn to business lost through various causes, there are numerous interesting items for the practical man and it is clear that this piece of internal public relations is no mere management propaganda. It is a well-produced and illustrated tabloid containing short articles and news items for railwaymen working on the line and in the office. The accent is personal: in addition to articles of general Regional interest which are common to all three editions, there are "personality" items which deal with matters of particular interest to each line. The newspaper is distributed free, and a note in the March issue indicates that its readership is increasing, for it contains an invitation to contact the Editor at Liverpool Street in case of difficulty in obtaining copies.

Britain's First Travolator

THE twin-track moving platform on a gradient of 1 in 7, known as the "travolator," being built to link the platforms of the Bank terminus of the Waterloo and City Line of British Railways, Southern Region, with the booking hall of the London Transport Underground station, will be the first use of a moving platform in an underground railway subway in Britain. The name travolator is as likely to be adopted as has been escalator. Moving horizontal platforms, as opposed to escalators, were features of exhibitions 60 years ago. Escalators were developed on an extensive scale by the London Underground, largely because they were the most convenient access to the deep-level tube lines. The Waterloo & City Line is not far below the booking hall at the Bank. This factor, and the horizontal distance, 300 ft., now traversed by

passengers in a sloping subway with steps at intervals, suggested a gently sloping platform. Passengers will be conveyed between platform and booking hall in 2 min. A brief report on progress to date is given elsewhere in this issue. The travolator is expected to be in service by the end of August, 1960. The 12-page booklet giving a description of the work, with drawings, distributed by the Southern Region to passengers using the Waterloo and City Line, is, like other literature so distributed which describes current civil engineering and other developments which affect the traveller, excellent public relations work.

Cologne-Bonn Railway

AMONG the 80 or 90 private railways still operating in Western Germany, the Köln-Bonner Eisenbahn takes a high place, because of the frequent passenger service over its own 18-mile route from the Rhine Quay at Cologne to its own station at Bonn, alongside the Federal Railway Station, and also because of its heavy short-distance mineral traffic. Normally there are four trains each way an hour between the two terminal points, two of which are fast trains making only one stop between the suburbs of the two cities; but there is a second line, from Bonn to the Barbarossa Platz in Cologne, which leaves the main line by a flying junction at Bonn West, and then runs to the west of the Federal Railway main line. This line has stopping trains only. The third route of the K.B.E. begins on the western branch line, and runs almost due east to the Rhine harbour at Wesseling; and this eight-mile route is the only part of the whole 45-mile system which is not electrified. But it carries 12,000 tons of brown coal a day down to the Rhine, and is double track with colour-light signals. This traffic now is handled mainly by eight MaK 800-b.h.p. diesel locomotives, and a sight still to be seen at Wesseling is that of 11 old Krupp 0-8-OT steam engines, which were the previous motive power, standing derelict. Passenger traffic on the two north-south routes is worked by twin-car electric trains coupled in multiple when traffic necessitates.

Mentioning Motive Power in Timetables

THE austerity of the passenger timetables issued by the several Regions of British Railways is mitigated by the coloured pages of summaries of services and of information on principal expresses and refreshment, sleeping, and reservation facilities and so on. The tables themselves generally give little information except times, the presence of refreshment, Pullman, and sleeping cars, and, in some Regional books only, the running of through carriages. The comfort and pleasantness of travel by many electric and diesel trains are now so great that where a complete service is electrically or diesel worked, this might well be shown in the timetables, as is done by the North Eastern Region. The Southern Region has missed a good opportunity in not mentioning, in the appropriate timetable pages of its summer book, that the lines concerned are electrified. With new stock in service on the Kent Coast lines, and the riding greatly improved in many of the multiple-unit sets on other services, travel by Southern Region main-line electric trains is, and will be, very comfortable. The Scottish Region indicates with footnotes the services worked by diesel sets. Where complete services are not diesel worked, this example might well be followed.

Curtain Collaboration

THE members of the International Union of Railways (U.I.C.) are drawn almost entirely from Western European countries; but behind the Iron Curtain there exists a corresponding body known as the Organisation for the Collaboration of Railways (OSShD). Its members principally are the railways in Eastern Germany, Poland, U.S.S.R., Czechoslovakia, Hungary, Roumania, and Bulgaria; but there is also association with the railways in China, North Korea, and Viet Nam, and representatives from those three countries often take part in the meetings. At the annual meeting of the OSShD at Warsaw in February a representative of the U.I.C. was present for the first time, as were representatives of three other international transport organisations. Despite restrictions, the amount of freight traffic passing between Western Europe and the Eastern bloc is considerable, so that closer collaboration between the two main regulating bodies is natural and desirable, and is being

strengthened by a meeting at Paris, this month, of representatives of the two bodies. Although at the moment these discussions are on a general level, and with interchange freight traffic methods as a main object, technical collaboration between West and East is already in being, for the Polish State Railways have been in the O.R.E. (Office of Research & Experiment) membership for some time.

Bridge Replacement Beneath Overhead Wires

THE presence of overhead electrified wires imposes many restrictions on civil engineering staff working on the line particularly when rail mounted cranes have to be used. When work has to be carried out with a short occupation of the line it is impossible to dismantle the overhead wires, and alternative methods of working have to be adopted. This problem was encountered when work was planned for the replacement of two underline bridges near Bethnal Green Station, Great Eastern Line, British Railways, Eastern Region. Each of the bridges consists of six separate girder spans on brick abutments. The normal method of replacement would be for the new spans to be prefabricated and brought to the site by rail and then lifted in by 45-ton steam cranes. Because of the presence of the overhead wires of the Liverpool Street-Chelmsford-Southend electric service, this method could not be used. Instead the new bridges were suspended from beams spanning the track between specially adapted bogie bolster wagons. The wagons were moved forward until the bridge was in position over the open span, and then the bridge was lowered onto its abutments. The whole operation, which has not been carried out before, is described elsewhere in this issue.

Locomotive Traverser for East Africa

THE 100-ft. locomotive traverser built to the order of the Crown Agents for Overseas Governments and Administrations for the Nairobi workshops of East African Railways & Harbours and described on page 462 is one of the largest in the world and almost certainly the largest for the metre gauge. It will accommodate "59" class 4-8-2 + 2-8-4 Beyer-Garratt locomotives weighing 252 tons. As with new locomotives and rolling stock, provision has been made for conversion of the track to 3 ft. 6 in. gauge if and when the latter is adopted by E.A.R. & H. A notable feature is the accuracy of inching for exact alignment facilitated by the foot-operated mechanical brake, which allows progressive braking as distinct from the instantaneous on/off action of the Holmes electro-pneumatic brake. Power is cut off by using a neutral notch on the controller without applying the electric brake. The mechanical brake is then used to stop the traverser in the correct rail alignment position.

Commonwealth Railways Diesel-Hydraulic Shunters

DELIVERY to the Commonwealth Government Railways by Clyde Engineering Co. Pty. Ltd., of six 545-h.p. diesel-hydraulic shunting locomotives with Maybach engines and Maybach-Mekydro transmissions, to supplement the main-line diesel-electric units on the Trans-Australian and Stirling North-Marree Railways, is a further step towards complete conversion of these 4-ft. 8½-in. gauge lines to diesel traction. The six locomotives, though primarily shunters, can be used in multiple for main-line freight operation at up to 40 m.p.h. The widest possible range in use is essential where the locomotive fleet is necessarily small in relation to the mileage of the system. There is no question that diesel traction has been found successful by the Commonwealth Government Railways. In view of the water shortage and remoteness from good locomotive coal, there are few railways more suited to this form of motive power. Features of the shunters referred to elsewhere in this issue include the exceptional torsional stiffness of the disc-web crankshaft with roller main bearings in the Maybach MD 325 engine.

British Transport Commission Financing

THE decision announced last week by the Chancellor of the Exchequer, Mr. D. Heathcoat Amory, in his Budget statement, to continue the present system of financing the nationalised industries for another year, evoked little comment during the debate on his Budget proposals. This is understandable, as their large and increasing capital investment programmes involve such considerable borrowings that any attempt to place them on the market in the normal way would be disturbing. This was the main reason why in 1956 the present Prime Minister, Mr. Harold Macmillan, decided that such financing should be by way of direct advances from the Treasury through the responsible Ministers and appear "below the line." Mr. Heathcoat Amory stated that the considerations of credit and market management which led to this original decision still ruled, and accordingly he had provided £580 million for the larger investment programmes which have already been authorised. This is some £138 million higher than last year.

The British Transport Commission share of this will be considerable, as not only is its capital investment programme financed in this way, but its deficit also. The "Economic Survey" gives the total projected investment for the current year as £211 million, of which £178 million is for the British Railways and £33 million for the Commission's other activities, including its road passenger undertakings, British Road Services, and canals, docks, and harbours. Not all is financed by the Treasury, as depreciation and renewal funds cover some of it. Nonetheless, with its finances in their present state the Chancellor seems to be correct in assuming that the Commission would have difficulty in obtaining finance on satisfactory terms through the market. In fact, it is difficult to look ahead to the day when it will be able to do so. Estimates of the deficits for 1958 and 1959 and the continuing decline in traffic augur ill for the financial future of the nationalised transport undertaking.

The Chancellor also stated that he was providing £6 million less for the financing of its deficit during the current year; but as last year's deficit is now expected to be £90 million, some £5 million more than the £85 million estimated in the autumn, it would seem that he expects to be called upon to meet a further deficit for 1959 of something over £80 million. In the financial statement actual payments made under the Transport (Railway Finances) Act are given as £94 million for 1958-59.

This covers both the net deficit of the Commission, that is the losses of British Railways less any surplus earned on its other activities, and the accumulated interest on past deficits. The estimate for 1959-60 is put at £88 million, of which probably some £5 million would be for deferred interest, leaving the net deficit at some £83 million—a grim prospect. If the losses continue at this rate, the statutory limit of £400 million plus deferred interest, will be reached before the period for which it applies, namely, up to 1962, has run its course. When the measure was passing through Parliament, the Opposition argued that to provide for the losses out of loans was only to postpone the day when there would have to be a financial reckoning of the Commission's capital liabilities, which were likely to reach such high figures that it would never be able to meet the interest charges on them and pay its way. The Opposition also expressed its belief that a capital reconstruction or permanent subsidies might then be inevitable.

Be that as it may, the present outlook can but give grave concern and makes it all the more urgent that the re-assessment of the Commission's prospects be quickly completed. This is being undertaken by the Commission itself at the instigation of the Minister of Transport & Civil Aviation, Mr. Harold Watkinson, with the object of determining whether, in the light of falling traffic and changing conditions, the modernisation programme needs re-adjustment and whether the estimates of breaking even by 1962 call for revision. It may well be that the answer to both will be found to be in the affirmative. Parliament, which in the final resort is responsible for the nationalised industries, no doubt will wish to receive the report and then debate the Commission's affairs. This is as it should be. It would be helpful if the B.T.C. report and accounts were then also available to it. These do not generally appear until towards the end of June, by which time practically half of the Commission's year has already passed. There is,

therefore, a case for following the precedent set when the modernisation plan was presented to Parliament, namely, publication of the preliminary results for 1958 in abridged form before appearance of the full report. This would enable a clearer picture to be seen and a more constructive consideration of the Commission's position to take place. Otherwise, there is the danger that the urgently needed review will be put off until the late summer.

Re-signalling at Newcastle

AT the close of the last century power signalling, some forms of which were being shown at the Paris Exhibition, began to attract the attention of British railway managers, some of whom about this time paid visits to the U.S.A. There a large amount of such equipment and also plain automatic signalling had been in service for some years. The old well-tried mechanical apparatus had given excellent results in Britain and was at the peak of its development at many busy termini, such as Waterloo and Liverpool Street, handling services which even then at rush hours were of remarkable density.

Within a few years important installations of power signalling and some lengths of automatic working were to be seen on main lines in Great Britain, principally on the L.S.W.R., G.C.R., and N.E.R. The last-named, on the advice of its General Superintendent, H. A. Watson, installed in 1904 automatic "electro-gas" signals of American design between Alne and Thirsk and had decided to adopt the electro-pneumatic system at a number of signalboxes. This had appeared on the G.E.R. for the control of goods lines at Granary Junction, Bishopsgate, in 1899, and in 1903 the L.Y.R. adopted this system for its passenger station at Bolton.

By that time it was being used for automatic signals on the District Railway's recently electrified Ealing and Harrow line and was shortly to be chosen for the whole of its system and the associated London tube lines. The N.E.R. beginning in 1902 at Bank Top, near South Shields, installed several e.p. signalboxes in that area, followed by two, totalling 320 levers, at Hull Paragon, while at Newcastle and at the east ends of the bridges leading into Gateshead were opened between 1906 and 1910, five on each side of the river. As originally constructed they contained over 960 levers; those at the east and west ends of the Central Station had 283 and 211 respectively. During this period the N.E.R. made a trial on goods lines at York of the Webb-Thompson, or "Crewe," all-electric system, but this remained the sole example outside L.N.W.R. metals. Some at least of these signalboxes at first apparently had little or no track circuiting working with them, but the situation improved in the course of time as circuiting equipment was installed.

To replace four out of the five boxes provided on the west side of the Tyne the new route relay signalbox in the middle of Newcastle Central Station, described elsewhere in this issue, has been brought into service. This is in pursuance of a policy under which considerable signalling improvements have been effected of late years, as at and near York Station and thence to Northallerton and Darlington, at Hull, Leeds, and more recently, Huddersfield (now in the North-Eastern Region). This continues the process of concentration of controls, which proved so effective at York from all points of view. Not only does the abolition of the former separate boxes achieve economy. It promotes better traffic regulation and increased general efficiency, eliminating the constant exchange of block, train description, and other messages unavoidable with earlier methods.

The new installation is constructed generally on the principles adopted for York, with certain improvements and with facility for extending its range of action. Electro-pneumatic point mechanisms were already in use but have been replaced by a more efficient up-to-date design, while the many lattice post semaphores, often carried on heavy gantries and once so characteristic of the old N.E.R., have disappeared in favour of the compact colour light signal with route indicators where required, greatly simplifying the driver's task. This and other changes had been in progress for some time as everything possible was done to facilitate the final changeover to the single centralised control. The telecommunication equipment,

of the most up-to-date type, exemplifies the great strides made of recent years in the development of electronic and other devices and their adaptation to the demands of modern signalling.

The Nigerian Railway in 1957-58

THE report of the Nigerian Railway Corporation for the year ended March 31, 1958, has been sent to us by Colonel Sir Ralf Emerson, Chairman of the Corporation. It is a remarkably well-written document, presenting information of considerable interest to railway officers and others in many countries besides Nigeria.

The 1957 crops were exceptionally large, and in the slack season before the 1957 harvest the amount of import traffic was considerable, as was the movement of farm produce for home consumption. The result was a consistent and sustained period during which northbound exceeded southbound (coastwards) traffic by a substantial margin—an extraordinary situation for the Nigerian Railway. Even, so, by mid-October, 1957, gross earnings were £1.5 million less than in the corresponding period of the previous year. From November, 1957, to March, 1958, the tonnage of crops moved for export was a record, and surpassed the amount which had been thought possible with the facilities available. The report points out that much credit is due to the operating and locomotive maintenance and repair staff who were responsible for making this movement effort possible. Circumstances differed greatly as between the first seven and the last five months of the year. During the latter period, each of the five months exceeded, as regards efficiency in movement, the best figure for any one month in any earlier period. For instance, goods net ton-miles per train engine-hour (goods, and goods proportion of mixed traffic) at 2,884 represented a very high standard for a 3 ft. 6 in. gauge railway, whereas for the first six-and-a-half months the corresponding figure was 2,454 because of lack of traffic and consequent smaller trainloads. Similar comparisons can be made in other respects. The annual figures obscure the fact that for five-and-a-half months on end the Nigerian Railway operated at a level never before equalled.

The following are some of the principal results for 1957-58 compared with the previous year :

	1956-57 Thousands	1957-58 Thousands
Passenger journeys	7,271	7,863
Tonnage hauled (paying)	2,052	2,031
Passenger train-miles	538	605
Mixed train-miles	1,291	1,323
Goods train-miles	5,125	4,896
Departmental train-miles	217	163
	£ thousands	£ thousands
Passenger parcels & mails receipts	1,865	1,944
Goods and livestock receipts	11,942	11,466
Road transport receipts	124	112
Total working receipts	14,296	13,777
Working expenditure	12,278	12,917
Net working receipts	2,018	860

The cost of the capital programme for existing lines in the five-year period to March, 1960, is likely to be some £22 million. Of this it has been necessary to defer work costing £4.3 million, partly because of restricted finance. These projects will be high priority in the years after 1959-60, and a very tentative programme during the five years to 1964-65 already totals £18.8 million. The 400-mile extension from Kuru to Maiduguri will cost £19.3 million. The International Bank for Reconstruction & Development loan of £10 million to the Government of the Federation of Nigeria for the purposes of the Railway Corporation will not meet the capital programme.

The Government has taken cognisance of this by providing a further £9.5 million in the 1962 Economic Programme. For the period after 1961-62, it is part of the agreement between the World Bank and the Government that the latter will provide funds to enable the Corporation to complete the agreed plan for improvement of the railway and construct and equip the extension to Maiduguri if its own resources are inadequate. The section from Kuru to Bauchi is expected to be completed in April, 1961, and the remaining 296 miles to Maiduguri by the end of 1963.

Events mentioned in the report include the closing of the 133-miles Bauchi Light Railway, which had been running at a loss for some years. Development of radio communications between district headquarters and certain stations continued,

and more installations were brought into use. Hasler recording and indicating speedometers were fitted to nine "101" class locomotives, to educate drivers in assessing speed and to ensure compliance with speed restrictions. Reference is made to the placing of an order for 25 General Motors 1,425 h.p. A1A-A1A main-line diesel-electric locomotives and to the building of two Drury diesel-mechanical railcar sets. On the first 750-h.p. English Electric Bo-Bo diesel-electric locomotive to attain its mileage for general repairs, the original tyres completed 208,197 miles without tyre turning. The performance of these locomotives is stated to have been generally very satisfactory.

The overall times of the Limited passenger trains were cut. For the 700 miles from Lagos to Kano the schedule in 1957-58 was 33.5 hr., against 39.57 hr. in 1954-55. Increases in the number of 68 per cent of first class passengers justified the improvements in speed and comfort of the Limited trains. A summary is given of the comprehensive system of staff training schemes, which were improved and amplified during the year.

Progress in 50-cycle Electrification

It is only three years since the British Transport Commission published its decision to adopt the 25-kV. 50-cycle system for future electrification in Britain, except for extensions to the Southern Region third-rail d.c. network, yet progress has been so rapid that the two trial sections are now complete.

That in the Eastern Region, between Colchester, Clacton, and Walton, was declared open by Sir Reginald Wilson, Chairman of the Eastern Area Board, earlier this week, and became the first line in Britain to operate commercially on the new high-voltage a.c. system. The other line being used as a proving ground is between Slade Lane Junction and Wilmslow, on the Crewe-Manchester line, London Midland Region. The whole of the Crewe-Manchester line is at present being electrified, but the completed section, known as the Styal line, is being used for the testing of equipment and the training of motormen.

Because high-voltage electric traction is relatively new to Britain, it is desirable to have an adequate proving ground for the new equipment. The Colchester-Clacton-Walton line is admirably suited to this role. The traffic over the line is mainly passenger, freight services being only local pick-ups. The passenger service consists throughout most of the year of two distinct elements, a service to and from London at hourly or two-hourly intervals, and a local service of low intensity. In the holiday season and at bank holidays additional services operate. This group of lines, amounting to about 24 route miles, including both double and single track, forms a compact entity and the comparatively low density of operation left a certain amount of spare line capacity for the running of special trains under test conditions.

Work on the electrification project was begun some two years ago. It was a complicated operation, involving tests at many stages. It is greatly to the credit of British Railways, and also to the contractors concerned, that a minimum of interruption and delay was caused to the steam services which had to be maintained during the period of reconstruction. Apart from the design and building of new electric rolling stock, the work carried out to prepare and electrify the line developed into three distinct patterns. A considerable amount of heavy civil engineering work was essential, to be followed by electrical and signal equipment installation.

To determine the amount of civil engineering work involved, the entire route was carefully examined to assess what was necessary in the way of re-alignment, re-grading, and re-ballasting of the permanent way. At certain points, embankments built of clay had to be strengthened and other steps taken to stabilise the formation. At Thorpe-le-Soken, the Holland Brook was diverted away from the bottom of an embankment which was widened to accommodate an additional track.

Many of the bridges along the line did not have the necessary clearance to permit safe passage for the overhead wires. To overcome this problem, several road bridges and foot bridges had to be raised. In some cases arches were dropped and replaced by pre-stressed concrete beams. A girder bridge was also removed and replaced by concrete slabs at a higher level. Track lowering was carried out at certain points.

Statutory regulations also required the parapets of nearly every overbridge to be raised. In all some 22 bridges had to be rebuilt or altered.

The overhead line equipment is of simple catenary construction, using a stranded cadmium copper catenary, and a single cadmium copper contact wire attached to the catenary by droppers. Erection of this equipment and its supporting structures was carried out from works trains. This procedure greatly increased the speed of erection and allowed a higher percentage of work to be carried out in a single period of line occupation.

It had long been known that the use of high-voltage a.c. current would raise certain technical problems for the Signal Engineer because of the possibility of interference with signal and telecommunication circuits. It was with this in mind that soon after the decision to adopt the high-voltage a.c. system of electrification, sites were chosen on the existing electrified lines which were suitable for use as testing grounds for signalling and telecommunications equipment operating under a.c. traction conditions. Tests were carried out on the Fenchurch Street-Bow Junction line, which normally operates at 1,500 V. d.c. The d.c. feeds were removed and low voltage a.c. applied in lieu through suitable control gear. The overline equipment was connected directly to the rails at the remote end of the test section, thus producing a return traction current in the rails which could be varied as required by increasing or decreasing the applied voltage. Resulting from the information gained during the tests, track circuits and other items of signalling equipment were designed for employment in future 50-cycle a.c. traction areas. The results of the tests also confirmed various theoretical deductions regarding the effect on the telecommunications cables and enabled cable requirements to be developed for future use.

Colchester, Clacton, and Walton passengers will benefit from a better and faster train service with the opening of the local electrification. Plans are well in hand for closing the electrification gap which now exists between Chelmsford and Colchester. When this section is electrified, through services to serve the North East Essex coast resorts will be introduced from London.

Vehicle Design Related to Track Conditions

RECOMMENDATIONS which may influence improvements in the safety and comfort of passenger-train rolling stock are made in a paper, *Vehicle Suspension and Bogie Design in Relation to Track Conditions*, by Mr. R. M. Hancock of British Railways Western Region Rolling Stock Research & Development Office, read at a meeting of the Institution of Locomotive Engineers in London earlier this week. The paper deals with the necessity of relating vehicle suspension and bogie design to the track conditions likely to be encountered in practice, particularly where lateral and crosslevel wave shape are concerned, as these are most likely to produce discomfort.

The vehicle-response basis of systematic testing main routes as carried out with the Western Region track-testing car has provided much of the experience from which the illustrations in the paper are drawn. The effects of coning and track shape, in relation to the riding of four-wheel vehicles, are considered with reference to an investigation of their derailment in fast trains.

The property which wheel coning has of transmitting and magnifying the effects of track misalignment to the vehicle body, Mr. Hancock believes, can be much reduced in new designs of bogies or in bogies which can be modified, by telescopic or other types of positive guiding for axles with self-aligning roller-bearing boxes, and wheels having the minimum of coning. For the latter, 1 in 50 is suggested to avoid running against one rail, which otherwise is likely to occur with increasing frequency as tread wear develops.

The elimination from bogie suspension of the frictional effects of laminated springs and suspension links, which play a large part in transmitting shock vertically and laterally from the track, can be attained with helical springs for both primary and secondary suspensions, and with rocking washer suspension links. For this arrangement, the dissipation of energy by means of hydraulic shock absorbers is recommended. Mr. Hancock sees the possibility, by varying the characteristics of these, particularly in the lateral application, of improving on the present compromise effect of conventionally-designed

shock absorbers. He feels that the setting of shock absorbers cannot be simplified to an overall factor, as the correct choice of damper build-up rates and maximum pressures is best determined by exhaustive riding tests. A diagram in the paper shows the cyclic resistance of a proposed hydraulic shock absorber with reduced resistance at mid-stroke. As an aid to development, it is suggested by Mr. Hancock that new bogie designs and modifications should always be tested over a wide variety of track and speed conditions and, if possible, altering only one variable for each test.

Equations relating the movements of the four-wheel vehicle to the track shape are given by the author and both the common and flange-climbing types of bogie hunting are analysed. A suggestion to speed the further mathematical study of vehicle reaction to track shape is to feed voltage variations from bogie-mounted potentiometer followers into an analogue computer set up to complete the equations of motion. This may make it possible to obtain graphical and magnetic-tape recorded component variations in track shape.

per cent fewer ton miles compared with an all-line drop in ton miles of 7.4 per cent. In contrast, the North Eastern Region lost 1,102,000 tons of traffic (11.4 per cent) and worked 49,558,000 fewer ton miles (11.7 per cent). Being a forwarding area, the North Eastern was hard hit by the recession in several staple industries, which caused exceptionally large decreases of 552,000 tons, or 29 per cent, in minerals and of 16,446,000, or nearly 19 per cent, in mineral ton miles. From the early days of railways, the North East counties have, like Scotland, been susceptible to sharp fluctuations in the movement of minerals and coal. Present day conditions have not changed that tendency, but we may hope that statistics for the second quarter of this year will make a better showing.

Letters to the Editor

(The Editor is not responsible for opinions of Correspondents)

Freight Train Traffic in February

(By a correspondent)

DURING four weeks to February 22, the downward trend of freight train traffic continued, though the rate of decrease was not so acute as in January. British Railways originated 20,146,000 tons, a decrease of 1,456,000, or 6.7 per cent, from 1958. Compared with 1957 over 3 million tons of goods were lost, a drop of about 14 per cent. Merchandise carryings of 2,939,000 tons were 152,000 tons, or nearly 5 per cent below last year's level and one-third less than 1949 forwardings. Compared with 1958 the resultant loss of revenue was £940,000, or 10 per cent. A further decline of 9 per cent in merchandise receipts over four weeks to March 22 shows that other types of transport are capturing high-class traffic which formerly earned a revenue of at least £2 10s. a ton for the railways.

Mineral traffic in the February period was lower by 619,000 tons, or 13 per cent, and seems to have diminished at much the same rate in March. There is a prospect that after Easter an increase in some branches of steel output may check the fall in minerals, which are easy to move and in 1957 earned more from the average wagon loaded than either merchandise or coal.

Since 1953 the decline in coal class traffic has been a growing menace to railway prosperity. In that year 175 million tons were put on rail; by 1958 forwardings dropped by 12 per cent to 154 million tons. Compared with last year there has been a further loss of 1,515,000 tons in the first 8 weeks of 1959, causing a drop in receipts of £1,489,000, or 6.5 per cent. Worse still, receipts in 4 weeks to March 22 fell by £898,000 or 8 per cent. Clearly relations between the development of the coal mining and railway industries have reached a critical stage.

For both industries the years from 1825 to the outbreak of the 1914 war were, in spite of many setbacks, a period of expansion. In 1913, coal output was 287 million tons and the railway companies were hard pressed to carry the volume of traffic and to handle exports at their coal shipping places. Ten years later, at the time of railway amalgamation, 276 million tons of coal were won and 104 million tons were shipped. By 1937, the last fairly good year for the coal trade before the 1939 war, production totalled 241 million tons, while the railways carried 188 million tons and shipments amounted to 36 million. Twenty years on, coal output fell to 224 million tons and rail carryings were only 167 million tons. The palmy days of the coal mining industry are gone beyond recall, and its shrivelling wagon loadings will cost more to move, for railroading is a volume business.

Among the Regional results for the first 8 weeks of 1959 the Eastern performance was unrivalled. It originated 73,000 more tons of merchandise (8.6 per cent) and worked 971,000 more merchandise ton miles (0.7 per cent). Also by carrying 8,000 more tons of minerals (0.4 per cent), the Eastern worked 7,821,000 additional ton miles (5 per cent). Its total tonnage was lower by 169,000 (2.4 per cent) against an all-line decrease of 3,344,000 tons, or nearly 8 per cent, while it worked 4.2

Railway Superannuitants

April 6

SIR,—The editorial article on railway superannuitants in your April 3 issue will be read with interest and gratitude by the many retired supervisory grades concerned. What is not generally realised is that since 1951 the salaries for various positions on the railways have been increased, in many cases as much as 100 per cent, and that the many who retired before that year have their pensions based on the lower figure in spite of the increase in the cost of living. This has been recognised and adjusted as regards the Civil Service and all other similar bodies with the exception of British Railways.

Yours faithfully,

W. T. POWELL

"Ninetysix," Junction Road,
Burgess Hill, Sussex

Diesel v. Electric Traction

April 5

SIR,—If Mr. G. H. Hafter, whose letter you published in your April 3 issue, were to read page 326 of your March 20 issue more carefully, he would find that the most important point made in the contributed article on British Railway prospects was that it was only net income which was of any importance and that, therefore, whether traffic improved as a result of the introduction of diesel multiple-unit sets or merely held its own, whether revenue rose or fell was of no consequence whatever unless the operation showed a clear margin over all costs. From this point of view much of the enormous outlay on diesel traction has been an experiment and an unsuccessful one. This is a most depressing business. It is unlikely to end there, for it is doubtful whether such other experiments as the Condor container service, the Manchester Pullman expresses, or the future diesel-hauled East Coast expresses are going to be much better off, and for the same reason: excessive capital charges.

As to the most powerful diesel locomotive, it is obvious that if the Americans can only go to 2,000 h.p. a unit, the 3,300-h.p. Deltic has it on all counts, whether the machines are used singly or in multiple. What is more interesting is your correspondent's revelations on page 386 of your April 3 issue, that the "average" train in the U.S.A. weighs 1,439 tons and requires 2.58 diesel units developing 3,750 h.p. As the locomotive would weigh at least 300 tons, a comparison with the 106-ton Deltic shows that the respective horse powers, taken at the diesel flywheel, would be 2.16 and 2.13 per gross ton. So one Deltic should be more than capable of replacing those 2.58 units. As neither of the diesels concerned offer more than two-thirds the output of an 80-ton European electric locomotive, the potential American market for lightweight and efficient motive power should be as good as it is for motorcars.

Yours faithfully,

L. IRVINE-BROWN

Tilston, Malpas, Cheshire

THE SCRAP HEAP

Praise for Notting Hill Gate Station

The Notting Hill Gate, London Transport Underground, is reported to have pleased travellers. A Central Line passenger from Ruislip has written to London Transport praising the station staff for their courtesy to passengers during the three years of reconstruction.

Umbrella Roofing

At this time of the year we wish that our ancestors or our landlord or even we ourselves had built a veranda... To be sure, it must in early April be at least the right kind of veranda—the name is technically applied to the covering over the passenger's head on a railway platform, and it may save him from a shower, but it has, as a rule, no protecting wings; the wind blows shrewdly down the platform's length and there is sometimes nowhere to take cover save behind an automatic machine, which even for the slimmest is pitifully inadequate.—From *"The Times"*

End of the Chicago Tunnel Lines?

The Trustee of the Chicago Tunnel Company, which for many years operated an extensive 2-ft. gauge electric railway system in tunnels 40 ft. beneath Chicago, is reported to have asked leave of the Federal District Court to petition the Interstate Commerce Commission for permission to abandon the lines.

At one time this system operated more than 60 miles of narrow-gauge electric railway in tunnels 6 ft. wide and 7 ft. 6 in. high. In its heyday some 150 electric locomotives were in use. Current was taken from overhead wires attached to the roof of the tunnels. There were more than 3,000 wagons of various types, mostly 12 ft. long and 4 ft. wide.

The tunnels were worked on a one-way system with lights at tunnel intersections. Trains were regulated by a dispatcher through an extensive telephone network. The bulk of the traffic was interchange freight between main-line railway stations, but some business concerns had their own private sidings and sent goods via the tunnels to the main-line termini. Other sidings were provided for coal wagons taking fuel to large buildings, which disposed of ashes also via the tunnels.

Berlin Terminus Demolished

Almost 88 years after it was opened to traffic, the Lehrte station in Berlin recently ceased to exist when the last remaining part, the main portal, was demolished by explosives. The station, with its columns, balconies, and turrets, was once a Berlin landmark. It was originally the terminus of the line approved by the Prussian Government in 1867 from Berlin to Lehrte via Rathenow, which shortened the journey from Berlin to Cologne by 2 hr., avoiding reversal at the then terminal stations of Magdeburg and Brunswick.

Opened in 1871, the Lehrte station

increased in importance. In its heyday there were 108 booked train departures a day. In 1932, the "Flying Hamburger" diesel train began running between the Lehrte terminus and Hamburg. Despite heavy bombing, traffic was maintained throughout the war of 1939-45, but in 1950 the State Railway of Eastern Germany decided to abandon the damaged station as part of a scheme to redistribute long-distance traffic among the Berlin termini.

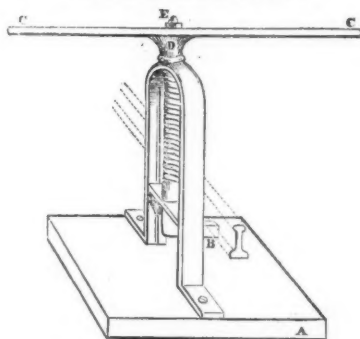
Temper Derailed a Train

In a temper because he could not cut a wire hawser in two, Alan Durrant, of Lowestoft, tossed it over his garden fence. It fell on the railway line and derailed a goods train, it was stated at East Suffolk Quarter Sessions. He was put on probation.—From the *"Daily Express."*

Platelayers' Screw of 1841

An engraving of 1841 shows the platelayers screw used for lifting rails on the Great North of England Railway. The base (A) supported a stirrup frame and a screw with a lifting claw (B) which was

THE PLATE-LAYER'S SCREW.



Screw used in the 1840's for lifting rails

drawn up by handle (D, C, C). The drawup bar was pivot-grooved in side slots of the frame. The device was considered a most useful tool by the platelayer of the time. It saved heavy labour and made easy the lifting of rail ends. It was claimed that a platelayer called John Swan conceived the idea which was put into practice by a civil engineer engaged on the Great North line. Sir John McNeill, the Irish railway engineer, approved of the device when he was shown it by John Goodwin of the Ulster Railway.

The New Look at Victoria (1909)

The new Victoria Station has at last parted with the forest of scaffolding and girders which beset the path of travellers. The fierce light that beats up from the newness of it all still seems to dazzle both public and staff. The sharp contrast of the present with the recent past is too arresting and may well surprise and even disconcert people who for many

years used narrow entrances and exits and elbowed through the dingy little platform gateways. There is one cause for regret—that is the substitution of the handsome but dark and nameless locomotives for the old yellow engines with the names of towns and villages painted on their sides.—From the *"Evening News"* of March, 1909.

[The yellow livery ("Stroudley's improved engine green") of L.B.S.C.R. locomotives was replaced under D. Earle Marsh, who succeeded R. J. Billinton as Locomotive Superintendent in 1905, by umber, and many engine names were painted out.—Ed., R.G.]

Inaugurations at Clacton

The Royal Hotel at Clacton-on-Sea, where the luncheon to mark the inauguration of electric traction at 25 kV. on British Railways, Eastern Region, lines between Colchester, Clacton, and Walton was held last Monday, was the scene of a similar gathering, in 1882, to celebrate the opening of the line from Thorpe-Soken to Clacton. The function, according to a contemporary account, "was hailed with delight by the inhabitants."

Unbooked Births in Trains

Births of babies in running trains were one of the causes of unpunctuality on railways, Mr. R. T. Shahani, Divisional Superintendent of Central Railway, said. (According to the Divisional Medical Officer of the Central Railway, 15 babies on an average are born each month in running trains in Nagpur Division.) Each childbirth held up the train for periods from 30 to 55 minutes, Mr. Shahani added.—From *"The Hindustan Times Weekly."*

Permanent Ways

(And some not so permanent)

Those solid, sinewy men of strength,
Who patiently patrol the length
By their beloved ballast bed,
May, on occasion, scratch a head
And sadly ruminate upon
The state of modern goings-on.
Keeping their watchful weather-eyes
On nature's inconsistencies,
They cope with camber, crest, and curve,
And all the other things that serve
The ever-growing transport need
For safety, certitude and speed.

Preserving ways of permanence
Entails the sort of vigilance
That earns an amnesty with fate
Which, although sorely tried of late,
Has, so far, safely kept at bay
Those tyrant twins, Change and Decay.

If all things pass, as someone said,
And death beshroud the ballast bed,
Those who now clamour for its place
Have still, it seems, to prove their case,
Since modern motorways, *per se*,
Aren't all they've been cracked up to be.

A.B.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

RHODESIA

Copper Traffic

A record amount of copper was carried by Rhodesia Railways during December, 1958 and January, 1959. In December, 67,939 tons of copper was carried, a record for any month, but this total was exceeded in January when 72,071 tons were carried. The previous record month was October, 1957, when copper carried totalled 59,653 tons.

Despite this recent trend, copper traffic itself is down on last year's figures as are most other commodities. Some examples in tons for the July, 1958, to January, 1959, period with comparative figures for the same months of 1957-58 are: copper, 334,002 (363,547); coal and coke, 1,967,564 (2,259,000); chrome ore 342,019 (432,708); limestone, 286,500 (300,213); lithium, 38,109 (60,582) and general goods, 2,550,418 (2,970,790).

AUSTRALIA

Diesel-Hydraulic Locomotives

To supplement the fleet of main-line diesel-electric locomotives at present in use on the Trans-Australian and Stirling North-Marree Railways, six diesel-hydraulic shunting locomotives have recently been delivered by Clyde Engineering Limited, New South Wales.

The locomotives have an 0-6-0 wheel arrangement and a total weight of 42 tons. They are capable of exerting a starting tractive effort of 33,000 lb. and have a continuous tractive effort of 28,800 lb. at 5 m.p.h. Although primarily intended for shunting work the locomotives can be used in multiple for main line freight operation at a maximum speed of 40 m.p.h.

Each locomotive is powered with a Maybach type "MD. 325" six-cylinder

pressure-charged four-stroke diesel engine developing a gross rating of 625 h.p. at 1,600 r.p.m. and of this total 545 h.p. is available for input to the hydraulic transmission for traction purposes. The Maybach type "MD. 325" diesel engine is of unusual design in that the crankshaft main bearings are large diameter roller bearing encircling disc shaped crank webs which give exceptional torsional stiffness to the design. Pressure cooled pistons with detachable steel crowns incorporating the annular compression piston ring grooves are fitted. Power from the diesel engine is transmitted by cardan shaft to the Maybach Mekydro type "K104U" hydraulic transmission.

VICTORIA

Abolition of Level Crossings

The next suburban level crossing to be abolished in favour of a road overpass is that at Elsternwick on the Melbourne-Sandringham line on which work has already started. The project, which will cost £400,000, is expected to take two years to complete, and involves the erection of a temporary station and a temporary level crossing to be protected by boom gates. Meanwhile the present late Victorian brick built station with up and down platforms will be demolished and replaced by an island type platform located in a cutting to serve the new track, which will be 20 ft. below the existing line. The future station buildings will be at ground level with a ramp leading down to the platform while gradients will be adjusted for some distance on both up and down directions.

Elsternwick is one of the five level crossings, which it was decided to abolish some years ago. Others were at Clifton Hill to the north of Melbourne,

where a road overpass has been built, Moorabbin, a south-eastern suburb, where work is partly completed, while the other two were in suburbs west of Melbourne at Footscray and Newport. The work at Footscray is well advanced, leaving the remaining one at Newport, where the Melbourne Road crosses a busy railway track, which, in addition to suburban and country traffic, is often closed because of shunting operations.

JAPAN

Tokyo Underground Extension

The Teito Rapid Transit Authority inaugurated the Marunouchi "U" line linking Shinjuku and Ikebukuro through the Marunouchi business centre on March 15.

The Marunouchi line took eight years to complete and links up with the Ginza line at Akasaka Mitsuke Station. The two lines are served by adjacent platforms to facilitate passenger interchange. The present four-car trains are to be lengthened later to six cars, and will be operated at an interval of 2½ min. during the morning peak hour, 3 min. in the evening peak hour, and 4 min. during the non-peak hours.

The newly opened section of the Marunouchi line has eight stations up to Nishi Ginza: Shinjuku, Shinjuku Sanchome, Shinjuku Gyoenmae, Yotsuya Sanchome, Yotsuya, Akasaka Mitsuke, Kokkai Gijido-mae, and Kasumigaseki.

CANADA

C.P.R. Road Vehicle Terminals

The Canadian Pacific Railway is planning the construction of major road trailer and motorcar terminals in Vancouver, Victoria, Nanairo, and Port Alberni. The cost of the four terminals will exceed \$1,000,000.

UNITED STATES

Automatic Marshalling Yard Routing

Certain new features characterise the recently-opened Boyles mechanised marshalling yard of the Louisville & Nashville Railroad at Birmingham, Alabama. One is the automatic route system by which the yardmaster, on an illuminated track diagram, can set any required route through the yard from the receiving sidings to the hump leads by a single switch movement. He next presses a button to enable the driver of the humping diesel to receive cab signals for directing its movements, the cab signal control then being transferred to the yard foreman.

The remainder of the yard equipment is of the usual type, with automatic switching and retarder controls, and television screens for checking the wagon numbers of inbound freight trains. The yard sorts an average of 3,500 wagons every 24 hours, and cost a total of \$12,000,000.

Main-line Working in New Zealand



Express train leaving Wellington for Auckland approaching the first tunnel on the Yawa Flat deviation. The 75-ton "EW" class electric locomotive hauls the train over the first 24½ miles to Paekakariki

Bridge Reconstruction on the Great Eastern Line

Replacement of life-expired underline bridges beneath overhead electrified wires

RECONSTRUCTION is now in progress of bridges No. 21 and 22 on the London side of Bethnal Green Station, Great Eastern Line, British Railways, Eastern Region. The bridges carry over Vallance Road and Hemming Street, the six sets of tracks over which almost all traffic in and out of Liverpool Street Station must pass.

The objects of the work are to reconstruct the bridges which are life-expired; renew life-expired junctions on and near the bridges; reposition the tracks to improve the alignments in anticipation of the higher speeds of electric trains as

they come off the Bishop's Stortford line; increase space between tracks; and improve drainage under the bridges.

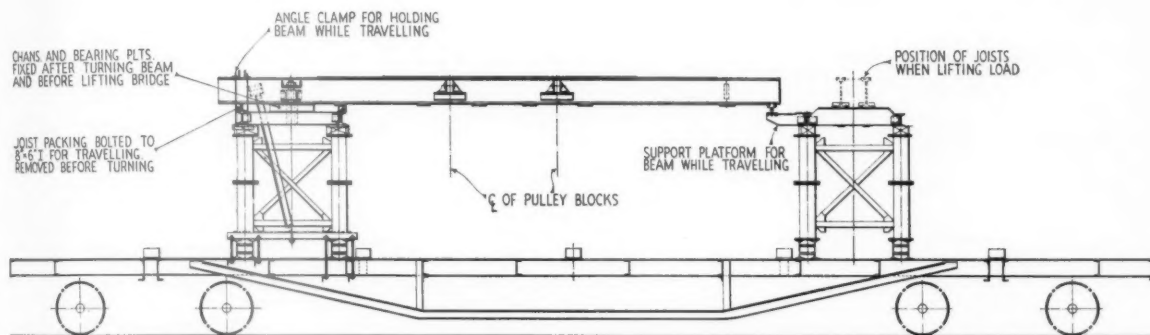
The reconstruction of these bridges, carrying some 1,100 trains during every 24 hours of the working week, is being carried out by staging. Work on bridge No. 22 was started in January and should be finished by Whitsun. The work on bridge No. 21 will be almost identical and will be carried out between the end of the summer timetable and Christmas, 1959.

Each of the bridges consists of six separate girder spans on brick abutments.

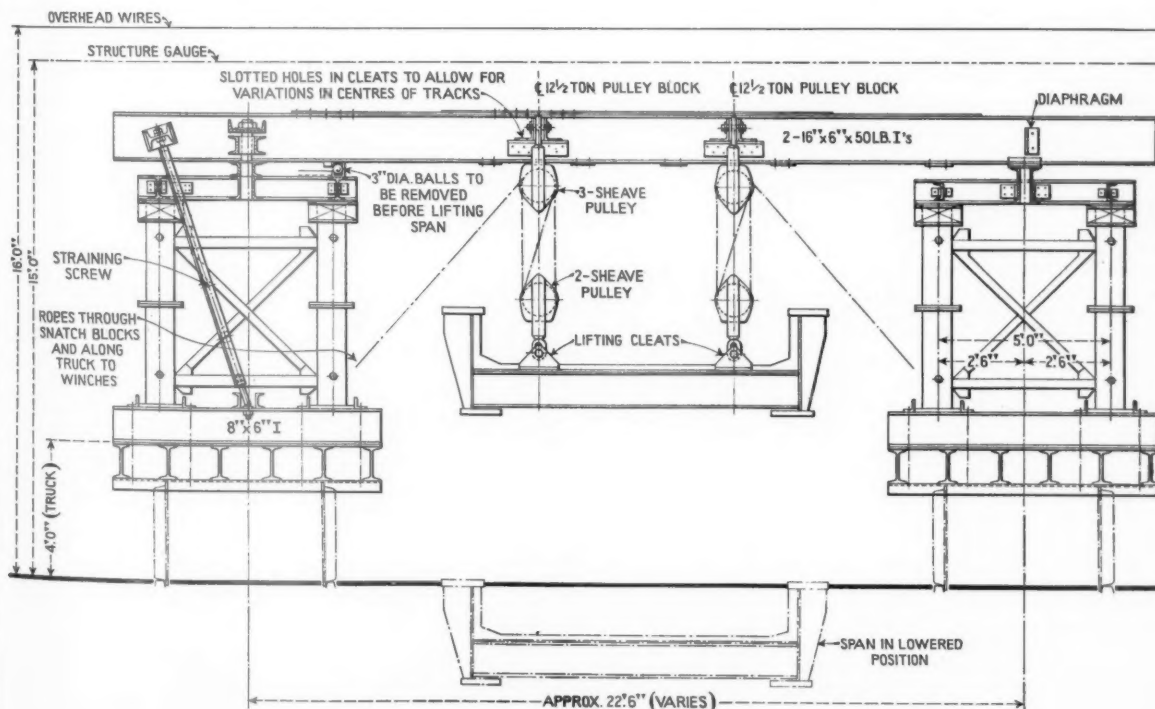
The normal method of replacement would be for the new span to be prefabricated and brought to the site by rail and then lifted in by 45-ton steam cranes. This method could not be used in this case because of the presence of the overhead wires for the existing Liverpool Street - Chelmsford - Southend electric service.

Permanent Way Alterations

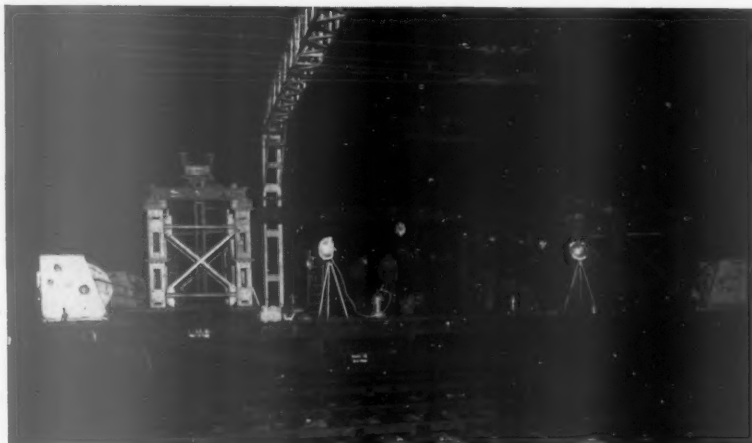
Before work was started on the bridge, a number of permanent way alterations were carried out in a series of week-end possessions of the line. The double



Bogie bolster wagon fitted with towers, with beam in travelling position



Front elevation of tower wagons, showing bridge span suspended from beams



Tower wagons standing together, showing one beam in working position and the other in travelling position

junction linking the up and down main lines with the up and down suburban lines, and the double junction between the up and down main lines and the up and down electric lines were situated partly on bridge No. 22. These were removed and plain line substituted as a temporary measure. The tracks on bridge No. 22 were supported on timbers resting on the back of the bridge abutments. The ballast was removed from the track and the deck of the bridge exposed.

The first span to be replaced was the second in from the west, that bearing the up suburban line. Hemming Street was closed to vehicular traffic so that trestling could be erected under the bridge. On this trestling were placed steel girders to carry the decking of the old bridge. In addition, steel waybeams were placed in position from the trestling to timber cribs at the back of the abutments. These waybeams were to carry the tracks until their removal shortly before the insertion of the new span. The main girder of the original bridge was then removed and the tops of the abutments prepared to take the bearings of the new span. The old girder was cut up into pieces which were removed from rail-level by a five-ton short-jib crane which can work well clear of the overhead equipment.

Rail-Mounted Equipment

Each of the new spans weighs 40 tons and is assembled at the Millwall works of Westwood & Co. Ltd. The entire span was brought by road by Pickfords (Heavy Haulage) Limited to Spitalfields Yard. At Spitalfields the span was transferred to a bogie bolster wagon.

Two other bogie bolster wagons had each been equipped with squat steel towers, one at each end of the wagons, spanned with slewing jibs. The three wagons were marshalled into a train which proceeded from Spitalfields to the site. The train was then broken up and the wagons shunted so that the one carrying the new span was standing on the track leading to the open span in the bridge. The tower wagons were placed on either side.

The jibs were swung out from both wagons across the centre track and made fast, forming two spans from wagon to wagon over the pre-fabricated bridge. The bridge was then lifted clear of its wagon by tackle on the spans and the wagon drawn out from beneath. The two wagons with the bridge suspended between them were moved forward until the bridge was in position over the open span. The wagons were halted and the bridge lowered on to its abutments.

Rolling-in Operation

This method can only be used for the four interior tracks. After removing the old span the up suburban span had to be transferred to the down suburban position by rolling in on phosphor-bronze ball bearings. This was carried out on the night of March 7-8. On March 14-15, the up suburban span was again replaced.

The replacement of the spans carrying the down main, up main, and down electric lines is proceeding in the same way as that carrying the up suburban line. The easternmost track, the up electric line, adjoins Spitalfields Yard

which is at a higher level than the running tracks. After the original span has been removed, the new one will be lowered by steam cranes standing in Spitalfields Yard.

Bridge No. 21 will be dealt with in the same way, but the work will be easier because of the absence of the junctions which complicated the operations on Bridge No. 22.

The contractor for the spans is Joseph Westwood & Co. Ltd. Erection is being performed jointly by contractor and railway labour. The permanent way work is being carried out entirely by railway labour. The designs were prepared and the work is being carried out under the general direction of Mr. A. K. Terris, Chief Civil Engineer, Eastern Region.

EASTERN REGION HOLIDAY RUNABOUT TICKETS.—Holiday runabout tickets are issued in 11 areas of British Railways, Eastern Region. The cost for most of them is 25s. for any seven days from April 26 until October 31. Map folders showing the areas and places of interest and giving full details of fares are now available at stations, offices, and agencies.

INCREASE IN TOURIST TRAFFIC TO BRITAIN.—The rise in tourist traffic to Britain from overseas continued in February. The British Travel & Holidays Association states that the number of visitors in that month was 43,640, 9 per cent more than in the same month of last year. Visitors from Europe numbered 21,490, 11 per cent more than in February, 1958. A feature of the European traffic was the increase in the number of visitors from France, 5,250, an increase of 34 per cent.

BRUNEL CENTENARY EXHIBITION AT CAMBRIDGE.—An exhibition to commemorate the centenary of the death of Isambard Kingdom Brunel will be held in the main entrance hall of the Engineering Laboratory of Cambridge University, Trumpington Street, Cambridge, from May 18 to June 19. It will consist mainly of drawings and photographs of Brunel's principal works. Members of the University and others interested will be welcome at any time between 9 a.m. and 5 p.m. on weekdays (Saturdays 9 a.m. to 12 noon).



Bridge suspended between tower wagons in position over open span

Colchester-Clacton-Walton Electrification

Civil, electrical and signal engineering work for 25-kV.

50-cycle a.c. electrification in the Eastern Region

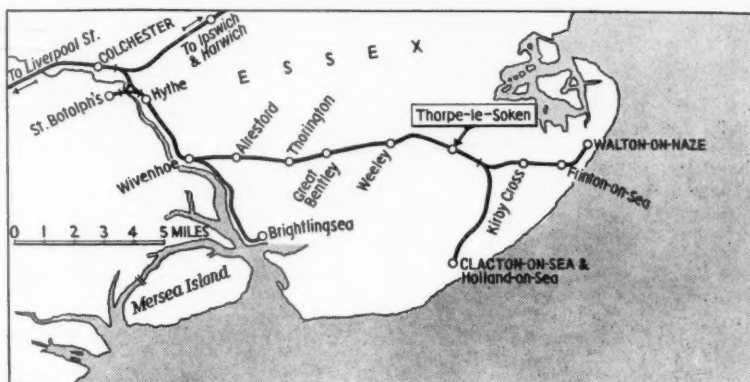
WORK is now complete on the electrification of the Colchester-Clacton-Walton line, British Railways, Eastern Region, at 25 kV. 50-cycle a.c. The line was officially opened to traffic last Monday.

Civil Engineering

There was little heavy civil engineering work involved in the electrification of the lines, but the work was varied in character, comprising the alteration of 22 bridges, the cutting back of station awnings, alterations to the track layout at certain stations, provision of load gauges and notices at 26 level crossings, lengthening of sidings at Colchester and Walton, and the provision of an extra siding at Clacton. In addition to this the steam locomotive shed at Clacton has been converted into a temporary inspection and maintenance depot for electric rolling stock and a carriage washing plant is to be installed. Temporary shed accommodation for steam locomotives and two small buildings for staff accommodation have also been built at Clacton.

Bridge Alterations

The use of high-voltage electric current demanded the raising or reconstruction of overbridge superstructures to obtain statutory clearance for the overhead wires and the current collector pantographs fitted on the trains. Six public road bridges needed to be reconstructed, three occupation bridges to be raised, and seven footbridges replaced or raised. In each case the parapets of the bridge



Colchester to Clacton and Walton branches and associated sections of Great Eastern Line, British Railways, Eastern Region

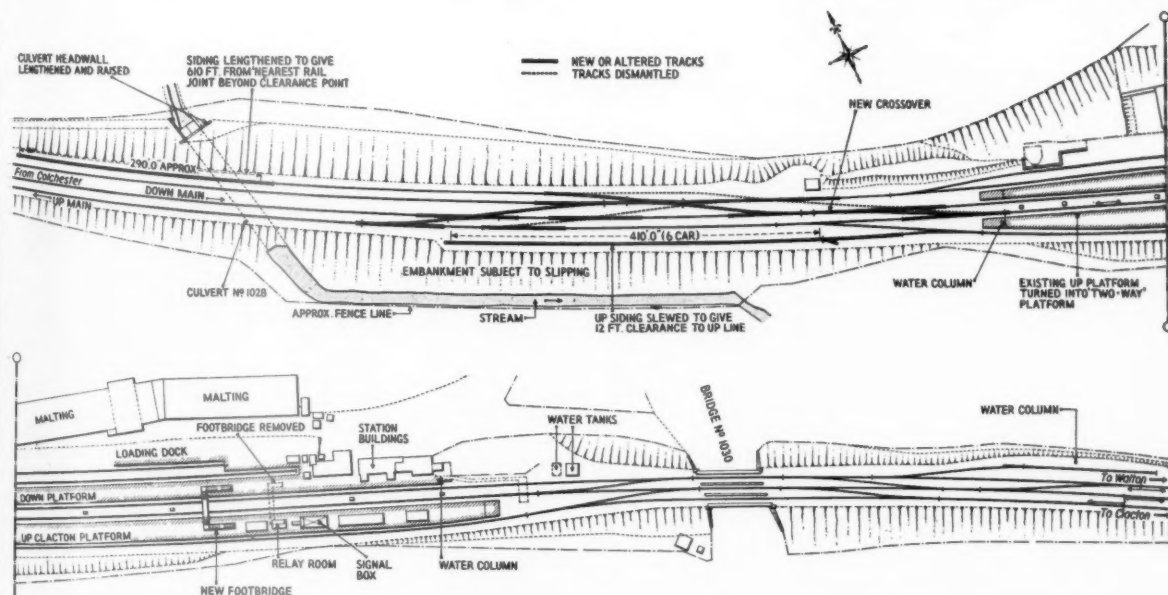
had to be raised to conform with statutory regulations.

One bridge, No. 1032, at Cooks Green, carrying the Little Clacton to Great Holland road over the main London-Clacton line, presented a special problem which was solved by the use, for the first time, of a new type of partially prestressed pre-cast concrete slab construction.

To obtain the extra clearance required between the bridge soffit and rail level it was necessary that the construction depth of the new superstructure should be reduced to the absolute minimum. By this means the lowering of the tracks was avoided, an operation which would have been difficult to achieve because of severe gradients.

The slab consisted of three or four pre-stressed, pre-cast concrete inverted "T" beams, 18 in. wide and 10 in. deep, placed side by side. These were encased with high quality added concrete to form slabs 33 ft. 5 in. long, 4 ft. 8 in. or 6 ft. 3 in. wide, and 16 in. deep to accommodate a water pipe. Before this added concrete was placed, solid rubber cores were positioned longitudinally between the precast beams to form cable ducts when withdrawn. When the concrete was sufficiently hardened the cores were withdrawn and high strength steel cables inserted in the ducts.

The cables were then post-tensioned by the Magnel-Blaton system and the ducts grouted with cement grout under



Altered track layout at Thorpe-le-Soken, showing former up platform road converted for two-way working

pressure. The resulting slab, although only 16 in. deep, is capable of carrying the prescribed Ministry of Transport load with an adequate reserve strength.

At the request of the Highway Authority and to provide realigned approaches in connection with a future road improvement scheme, the bridge was widened, and altered from a square bridge to a skew bridge, thus increasing the span of the deck slabs to 30 ft.

During construction, the road was closed to all vehicular traffic. A temporary footbridge was constructed for the use of pedestrians and cattle. The existing road surface and the girder and jack arch superstructure were removed and the abutment widened to accommodate the new skew bridge and built up to the soffit level of the new deck, below which

that used at Cooks Green but because the final road level was to be rather higher than the original, the final stages of the reconstruction took a different course.

The bridge was stripped of its road surfacing and spandrel fill down to the brick arch, half a width at a time, but because of the height of the arch, the deck had to be cast 1 ft. 9 in. higher than its final position. After the demolition of the arch the whole of the deck and cill beams were lowered in two halves by jacks into their final position. During construction only one lane for vehicular traffic was open over the bridge, and the added concrete was placed over each half of the bridge in one operation before stressing the post-tensioned cables. The abutments of the bridge are finished

Kirby Cross, Frinton, and Clacton have been cut back to provide lateral clearance for the overhead electrical equipment. The awning at Frinton, being of reinforced concrete, was cut back by a thermic lance, the first time this method has been used on the Eastern Region.

A feeder station, a control room, a number of relay and track sectioning cabins were constructed to house electrical equipment and these follow conventional designs.

Overhead Line Equipment

For the overhead line equipment simple catenary construction is employed using a 19/0.083 in. stranded cadmium copper catenary, and a 0.166 sq. in. single cadmium copper contact wire attached to the catenary by droppers. Most of the overhead system is of the weight-tensioned type, constant tension being automatically applied by balance weights. At all terminal stations where running speeds are low, fixed termination simple catenary equipment has been installed.

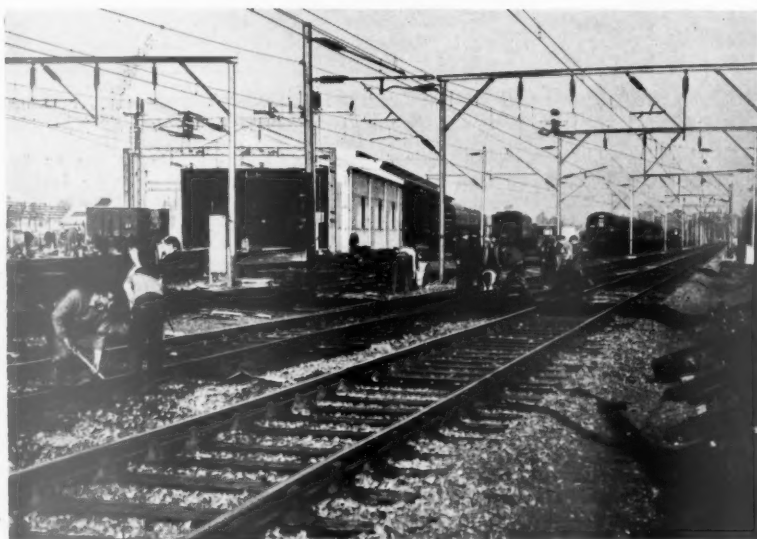
The structures supporting the overhead line equipment are mainly of three types: B.F.B. (Broad Flange Beam) section, fabricated lattice, and fabricated welded rod. On open route sections of the double line track the great majority of structures consist of separate B.F.B. masts acting as single track cantilevers for each track. With weight-tensioned equipment, the structure spacing is up to a maximum of 240 ft.; this spacing being reduced to a maximum of 210 ft. where fixed termination equipment is used. All overhead line equipment structures are galvanised.

Overlap spans and neutral sections have been installed at convenient points along the line, which is thus sectioned electrically, not only at the Feeder Station and track sectioning cabins, but also by switches at certain strategically placed overlap spans. The a.c. feeder cables from the feeder station have been laid in concrete troughing at surface level to their respective switches mounted on the neutral section structures.

Foundation work and erection of the supporting structures in open country sections of the line was carried out with the aid of the earth boring, steel erection, and concrete mixing units. At locations where steel was available at the time when foundation work was carried out, the method of construction evolved on the Eastern Region electrification of the Shenfield-Chelmsford and Southend lines was employed. This enabled the entire process of excavation, mast erection, and concreting to be performed in sequence during one occupation of the line.

Power Supply

Electrical energy at 25kV, single phase, 50 cycles, is supplied direct by the Central Electricity Generating Board, Eastern Division, to Colchester Feeder Station, situated approximately a quarter of a mile from Colchester passenger station. This supply is transmitted to the feeder station by two 0.25 sq. in. concentric type 25-kV. single-phase cables which are connected to two 7½-MVA



Track work in progress under overhead electric structure showing electric car sheds in background at Clacton-on-Sea

concrete cill beams cap the increased height of the brickwork and act as bearers for the slabs.

Ipswich Road Bridge

The provision of clearances underneath Ipswich Road bridge, Colchester, posed problems similar to those encountered at Cooks Green bridge and a similar technique was employed to overcome them. The original bridge consisted of a skew brick arch with a single span of 55 ft. Because of the proximity of a level crossing the wire height has to be higher than that normally required, thus increasing the clear headroom to be provided. This necessitated an adjustment to the surface of the road, but to keep this to a minimum, the special type of prestressed concrete deck used for Cooks Green bridge was installed, but in this case the depth/simple span ratio was as low as 1/30. In this instance the deck consists of pre-cast concrete inverted "T" beams, 18 in. wide by 14 in. deep, placed side by side and suitably supported from the arch. The method of fabrication of this deck was similar to

with sand-faced engineering bricks with artificial stone quoins.

Track slewing and the re-positioning of points to make room for the erection of the overhead line equipment was necessary at Colchester, Hythe Junction, Wivenhoe, Great Bentley, Thorpe-le-Soken, Clacton and Walton. At Thorpe-le-Soken Station the centre track has been converted for two-way operation so that trains stopped at the station for division into Clacton and Walton portions may be passed by non-stop services.

Permanent Way Alterations

At Stanway, beyond Colchester, the sidings were considerably enlarged and re-modelled and a road was built to a depot and storage space for steel masts, drums of catenary, contact wire and other material. Fourteen sidings have been laid in covering an area of some 12 acres. Extensive drainage work was undertaken at Thorpe-le-Soken where the Holland Brook was diverted to a new course so that the embankment could be strengthened.

The station awnings at Colchester, Wivenhoe, Alresford, Great Bentley,

132/25-kV. single-phase transformers at the Colchester C.E.G.B., Eastern Division, substation.

At Colchester Feeder Station the two Central Electricity Generating Board 25-kV. cables are connected to a three-section 15-panel switchboard. This switchboard incorporates two 300-MVA. incoming-supply single-phase oil circuit breakers from which the single-phase busbar is fed. Two bus section switches are connected on the busbar making the three section busbar switchboard. Also on this switchboard are the 300-MVA. 25-kV. single-phase track feeder oil circuit breakers for supply to the Colchester-Clacton line.

Alresford, Thorpe-le-Soken, and Clacton track sectioning cabins parallel all sections of the overhead line conductors by 150-MVA. single-phase oil circuit breakers similar to those installed at Colchester Feeder Station.

Supervisory Control

As this is a pilot electrification project, a temporary supervisory control station has been built adjacent to Colchester Feeder Station. From this control station, the circuit breakers in the feeder station and track sectioning cabins are remotely controlled, together with eight power-operated switches which have been erected at various locations along the line on the overhead equipment structures. Specially screened star-quad type pilot cables for the remote control of track switches and the oil circuit breakers at Alresford, Thorpe-le-Soken, and Clacton have been laid in concrete troughing alongside the line in conjunction with the signal and telecommunication cables. The type of supervisory equipment installed employs a system of coded voice frequency signalling which has not previously been used on British Railways.

All the running lines from Colchester Junction to Clacton-on-Sea including the branch to St. Botolphs have been re-signalled. Continuous track circuiting has been installed with colour-light signals of the searchlight type. Block working has been abolished and the signalboxes at Hythe, Alresford, Thorington, Great Bentley, and Weeley have been closed. All the equipment used has been designed for use in connection with 25-kV. 50-cycle overhead line traction. The track circuits are of the d.c. single rail type and none appreciably exceeds 500 yd. in length. At Alresford, on the down line, a short section of the traction equipment can be energised for test purposes at 6.25 kV. and the track circuits on this section are limited to 200 yd. in length. The signals are of the searchlight two- or three-aspect pattern with a fourth aspect added where required to achieve correct braking distance.

Junction indicators of the five-lamp type are installed for facing running movements. All signals capable of displaying a red aspect are equipped with telephones to the signalbox in advance, the majority of these telephones are of the selective calling type. Six point machines of the combined type incorporating track locks have been installed

and are operated from 110-V. batteries of Nife cells. The crank handles for these machines are kept in cupboards adjacent to the machines and are released by the appropriate signalbox. Power supplies for all signalling are taken from local sources at Colchester and Thorpe-le-Soken at 650 V. 50 cycles single phase. In the event of failure of either of these supplies, automatically operated contactors change over to a standby supply derived from the 25-kV. traction system.

Cable Installation

The aerial line route has been abolished and all circuits, both signalling and telecommunications, are carried in cables laid in a cable route which consists essentially of ground level concrete troughing. Cement asbestos trough carried on posts 4 ft. 6 in. apart is used in certain localities where the ground level trough is unsuitable. The signalling cable is of the multi-core rubber-insulated and rubber-sheathed type. The telecommunication cables are air-spaced paper-insulated conductors having an aluminium sheath with two P.V.C. sheaths on the outside. At stations where the signalboxes have been abolished and also at the level crossings; Colchester Road, Frating, and Burrs Farm; new ground frames have been installed for gate and siding control.

Plug-in relays have been used throughout in signalboxes and lineside apparatus cases. Line circuits operate on 24 V. d.c. The greater part of the wire used in relay rooms and apparatus cases is of the flame-proof flexible type. Solderless tag connectors are in use with this stranded wire.

On the Thorpe-le-Soken to Walton

line the existing semaphore signalling has been retained. The cabling and cable route follow the same principles as those adopted on the Colchester-Clacton line.

The whole of the civil engineering and building works were carried out under the general direction of Mr. A. K. Terris, Chief Civil Engineer of the Eastern Region. The electrical equipment has been designed to the overall requirement of Mr. S. B. Warder, Electrical Engineer to the British Transport Commission and the installation has been carried out under the general direction of Mr. K. J. Cook, Chief Mechanical and Electrical Engineer, Eastern and North Eastern Regions. The signalling work, with the exception of certain mechanical work for which the appropriate railway departments were responsible, was carried out to the specification of Mr. R. A. Green, Signal Engineer, Eastern Region.

The principal sub-contractors were as follow:

Overhead line equipment	British Insulated Callender's Construction Co. Ltd.
Isolating switches	Hackbridge & Hewitt Electric Co. Ltd.
High-voltage switchgear	Fuller Electrical Company
High-voltage cables	Pirelli General Cables Limited
Signalling equipment	W. T. Henley Telegraph Co., Ltd.
Telecommunication cable	Siemens & General Electric Railway Signal Co. Ltd.
Selective calling signal post telephone equipment	Pirelli General Cables Limited
Bridge reconstruction	Standard Telephones & Cables Co. Ltd.
Precast beams	Wellerman Bros. Ltd.
Clacton motive power depot, alterations and relay rooms	W. & C. French Limited
Feeder station, control room, and relay room	Anglian Building Products Limited
	C. H. Chaston Limited
	Cubitt & Gotts



Colour-light signals with route indicators and overhead electric structure at the country end of Thorpe-le-Soken Station

Resignalling of Newcastle Central Station

Route-relay interlocking signalbox replaces four boxes with power frames installed early in the century



Control room, showing traffic regulator's desk, control panel, and part of diagram and train describer panels

ON April 12, the North Eastern Region, British Railways, brought into operation a new route-relay interlocking signalbox above the platforms in the centre of Newcastle Central Station. The signalbox controls some 10 miles of line; including Manors Station, the High Level and King Edward Bridges, and covering the western main line as far as the entrance to the Forth Goods Yard, where the existing signalbox remains in service. The new box, of 641 route switches, with provision for extension, replaces four electro-pneumatic power boxes of individual lever type.

Signals and Points

There are 94 searchlight running signals with 12-V. 12/16 W. 2-pin S.B.C. tripole lamps. The three-aspect signals are confined to the ends of the bay platforms. Where four aspects are required, there is an additional yellow unit. There are 61 theatre type route indicators.

Eighty-six individual subsidiary shunt signals, display a red and a white light horizontally for "stop" and two white lights at 45 deg. for "proceed." The subsidiaries fixed below main signals, of which there are 84, are normally dark and have a "C" (calling-on sign) in place of the red light.

Point Operation

Points are operated by compressed air, through an economical movement, driven by a 5-in. cylinder, with 8-in. stroke controlled by a "Style CP," or constant pressure, 24-V. cut-off valve. There are 131 sets of points, including 13 movable diamonds.

Air is supplied to the points, through a 2-in. main, from two compressor stations, one at the east, the other at the west of the signalling area. Each houses a main and a stand-by electrically driven compressor. At the east end these are 20 b.h.p. rated at 100 cu. ft. of air per min.; at the west end, 12 b.h.p. at 50 cu. ft. The supply system is in two zones

and should there be loss of air in one, that can be connected to the other. The compressor motors work at 440-V. 3-phase, 50 cycles, with alternative supply available in emergencies,

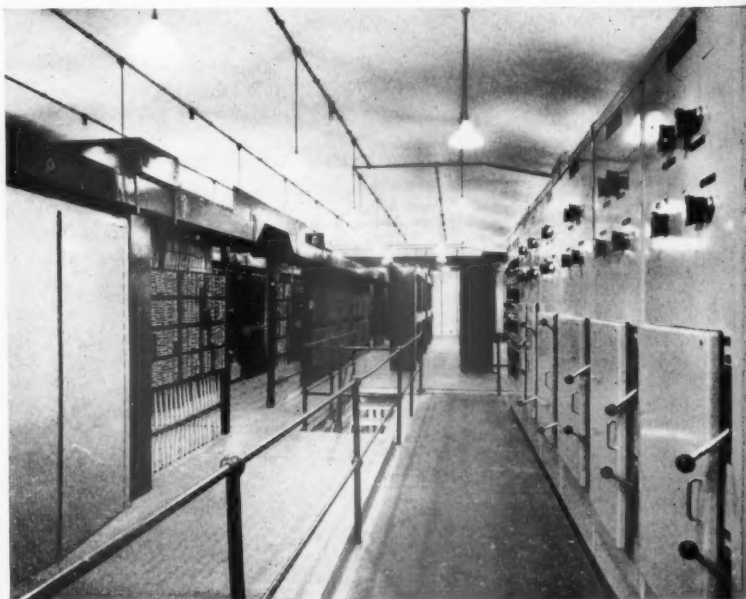
Track Circuits

There are 260 track circuit sections, providing full automatic control over the relevant signals and points. The circuits are of the a.c. reactance feed type, with 150-V.A., 110/12-V. transformers and adjustable reactances, and resonated double-element vane relays, 110V. local, and 1.2/2 V. on the control coil.

Signalbox

The control room in the signalbox has a route switch console of Westinghouse O.C.S. type, with, above it, an illuminated diagram, 53 ft. long and 4 ft. 6 in. high, arranged in four sections with one signalman to each. Between the outer sections set at an angle to the centre ones, are panels for train describer push buttons and signalman's telephone switches. The train describer display indicators are above the diagram, on which the track circuit sections appear in distinctive colours. A red light at each end of one denotes an occupied section.

There are 2,840 route lights. As soon as a route becomes cleared for a train, it is illuminated in white throughout and remains so until the movement is completed and the route restored to normal. Flashing green lights serve as "train ready to start" indicators. They are extinguished when the relevant starting signal is cleared. The route switches, of plug-in design, are arranged



Relay room, showing (right) low-voltage distribution panel



Clock system, showing master and standby clocks and dials

in two groups, upper and lower, corresponding to the two directions of running through the area, and are coloured red for main and white for subsidiary signals and engraved each with its route identifying number. Alongside is a small plate describing the route.

For each signal there are switches covering the routes to which it leads. These lights are placed above the relevant switch groups.

Individual point operation, when necessary, is effected by 3-position switches, which must be placed in the central position before the points can respond to a route switch.

The Traffic Controller has a desk on a central dais, from which he can see the whole of the diagram, switch console and train describers.

Operating Procedure

Turning a route switch energises the main signal lock relay reverse which, in turn energises the associated subsidiary lock relays (where provided) reverse. The intervening subsidiary signal lock relays then reverse in sequence up to the next main signal. All signals are now ready to be cleared. The last subsidiary control relay then proves the track clear and points correctly set before the signal goes to clear. The intervening subsidiary control relays then operate, similarly in sequence, back to the main signal controlling entry to the section, the signals going to clear. All intervening control relays are now energised with full track circuit control throughout the route and all signals clear. In an emergency the signalman can put any intervening subsidiary signal to danger after the train has entered the section.

Each subsidiary signal has its separate controlling switch and to bring a train into, say, an occupied platform the main signal is, of course, maintained at danger and the subsidiary below cleared, with the "C" indication showing; intervening subsidiaries are also cleared up to the point required. Full approach locking is provided.

The describers give the description and destination of the train concerned, as set up in code by the originating signalman, and show what signal the train is approaching at the moment. The indication moves automatically as the train passes over the track circuits. Initially, the display at both the transmitting and receiving ends is shown as a flashing indication, with a buzzer sounding at the receiving station. The buzzer is silenced and both displays are steadied by the depression of an "acknowledge" key by the signalman at the box towards which the train is proceeding. Provision is made for manual operation in the event of any of the controlling signalling apparatus being out of order.

There is special provision for light engine movements between the Heaton Motive Power Depot and Manors Station bay platforms. The descriptions for these engines, on the appropriate signals being cleared, are transferred from the Newcastle receiver display to the transmitter display, and are sent forward automatically.

The train describer apparatus is of the all-relay telephone type, with relays on jack-in panels to facilitate routine maintenance. Open racking is used at the new signalbox, but at the outlying boxes relays are in dust-proof cubicles. The whole of the new signalbox is fully air conditioned and centrally heated; special care has been taken to provide a high degree of sound insulation in the control room.

Relay Room

The relay room, 85 ft. by 56 ft. by 18 ft., adjoins the control room, accommodating on two floors the interlocking, track, point indication, signal control, "stick" and other relays. All control relays have detachable tops. Interlocking

relays are of 24 V.d.c. solenoid type, with 26 N. and 26 R. independent contacts. Each lock relay has its own rectifier to eliminate false energisation, possible if a common power supply fed all interlocking relays. There are approximately 850 lock relays and 2,000 others for controls, indications, releases, etc. About 400 miles of single-core cable was used for their wiring. Multi-core cable connects the console with the track diagram. All wiring is V.I.R. flameproof cable.

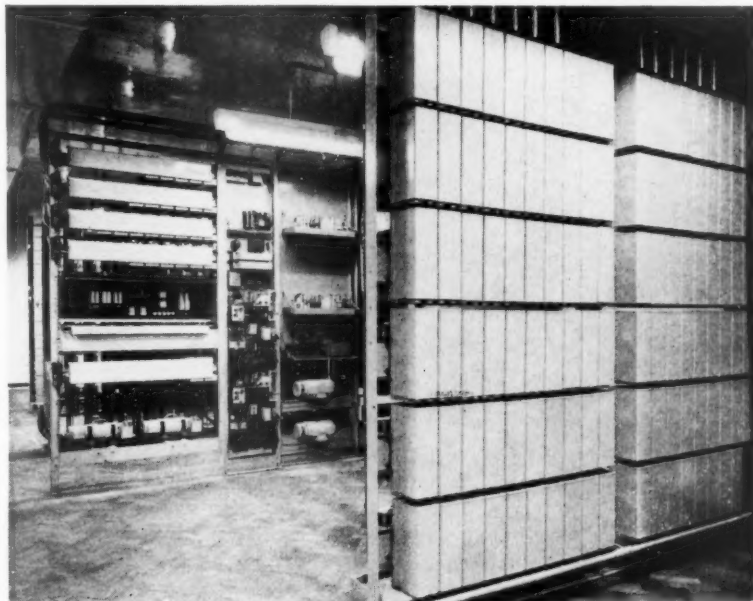
Telecommunications

Traffic requirements necessitate a comprehensive telecommunications system, converging on the new signalbox. The staff there can make immediate contact with adjacent signalboxes, by separate direct telephone circuits. Communication is provided also with station and sidings staff at many points and with signalmen as far as Durham, Blaydon, Tynemouth, and Killingworth, also with the Controllers at Newcastle and Sunderland, who direct the traffic in the whole Newcastle District.

Automatic ringing out and selective "calling in" facilities on each circuit ease the burden of signalmen and regulator. There are 47 direct circuits to specific signals, enabling train crews to speak to the signalmen. Lamp indicators on the console show from which signal a call comes.

To minimise delays caused by frost, snow, or other bad weather, 29 "emergency point zone telephone" plug points have been placed at selected important locations, connecting with the signalbox. Permanent way staff, by using portable plug-in handsets, can converse with the signalmen when testing the movement of points during snow clearing.

In addition similar plug-in points are



Telecommunications room, showing train describer, public address equipment, and telephone apparatus

placed in all lineside cable termination housings, connecting with a keyboard in the signal relay room. Maintenance staff outside can call those at the signal-box by using their portable telephones, and in turn be called by the production of a high frequency tone in loudspeakers alongside the track.

At the important East and West junctions are others known as "talk-back" loudspeakers, through which the signal relay room maintenance staff can converse with those maintaining the point motor and detection mechanisms and track circuit functions. This system can be extended to the signal box control room in times of emergency for use by the Traffic Regulator.

In the centre of the telecommunications apparatus room is the main distribution frame on which are terminated all telecommunication cables entering and leaving the Central Station. These serve all telephones on the signalling system, the railway telephone exchange, and long distance trunk circuits between London and Scotland. At this point the maintenance staff have complete control of all telephone cabling systems in the area enabling alterations in routing and testing of faults to be carried out at a minute's notice. A special fusing and cable termination system has been incorporated on the frame to protect staff and equipment from fault currents and surges occurring on

the Newcastle electric traction system.

A complete system of controlled electric clocks, worked from a temperature-regulated pendulum master, covers the administrative offices and the new and adjacent signalboxes.

There are approximately 100,000 exposed contacts to be maintained in a clean state and to assist this humidity controlled clean air is injected into the room and used air extracted.

Cabling

There are more than 50 housings where cables are terminated. Some are of steel, but are of brick where a large number of cables converge.

Cabling between housings and the signalbox is multi-core, oil-impregnated, paper-insulated, lead-sheathed and armoured and totals more than 35 miles. Between housings and signals, point machines and so on, rubber insulated polychloroprene sheathed cable is used.

Track side cables are supported by hangers or run in ducts: the main run is carried into the relay room over a steel gantry across four sets of freight lines, carrying 45 50-core cables. Inside the relay room 85 multi-core cables are terminated on fused links, which protect from fault currents and surges occurring on the electrified lines, as with the telecommunications circuits.

Power at 660V. single phase is taken from two independent public supplies, and no standby alternator has been considered necessary, and connected to bus bars through oil-filled circuit breakers.

Ring main supplies to external signalling functions are connected to these through air-break circuit breakers, as are the 660/110V. transformers feeding the signalbox 110V. busbars. Thence supplies are taken to the d.c. supply rectifiers, indication transformers and the 110V. distribution system in the relay room. The supply transformer for the subsidiary signals has 110 and 55 V. secondary outputs for day and night supplies, remotely selected from the control room. Instruments indicate the load condition, supplemented by coloured light indications of the position of the circuit breakers and supplies available. Remote indication of main supplies is also provided on the Traffic Regulator's desk. All the switchgear is "back of board" mounted on the power supply panel with flush mounted instruments. Automatic carbon dioxide fire protection is provided for the power cubicle, relay room and so on, on the Kidde pneumatic trip fire-fighting system.

Planning and Progress

Planning of the scheme was begun under the late Mr. C. Carslake when Signal & Telegraph Engineer, North Eastern Area, L.N.E.R., and continued by Mr. J. H. Fraser, when Signal & Telecommunications Engineer, of the North Eastern Region, it has been completed under the direction of Mr. A. F. Wigram, Mr. Fraser's successor.

The internal work (wiring, erecting relay racks and so on) has all been carried out by Westinghouse Brake & Signal Co. Ltd., with the exception of the telephone and train description apparatus which has been installed by Standard Telephones & Cables Limited. The outside work relating to signals, points, tracks, circuits, cabling and cable housings (steel) was carried out by the Signal Engineer's staff, who also provided the temporary circuits in the existing signalboxes to control the new signalling before it was placed in service.

In the first stage, the electro-pneumatic semaphore signals controlled from the four displaced signal boxes were changed over to colour-light signals and the control lines for signals, points and track circuits, put into the new termination housings. Temporary 50-core cables were used to tee into the displaced signalboxes from the housings until the new installation came into full operation.

The structural design of the control and relay rooms presented interesting problems, particularly in the erection sequence, in the first stages of which the new framework had to be built around and finally made to support the existing arched station roof.

The civil engineering and construction work was carried out under the direction of Mr. A. Dean, Chief Civil Engineer, North Eastern Region.

The principal contractors for buildings were E. Davis (Fixers) Limited for the steelwork, and Hadden & Hillman for general building work.



Power supply distribution room, showing main and stand-by equipment

RAILWAY NEWS SECTION

PERSONAL

Mr. H. W. Marsh has been appointed a director of the Canadian National Railways succeeding Mr. W. J. Parker whose term of office has expired. Mr. Marsh is a director of a number of companies in Regina.

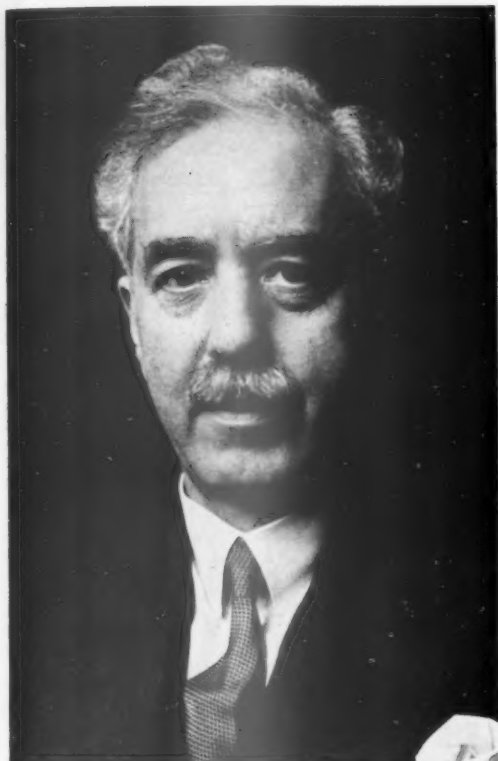
Sir Gilmour Jenkins, Permanent Secretary to the Ministry of Transport & Civil Aviation, who, as recorded in our February

Mr. R. H. C. Hackshaw, Operating Superintendent, Transportation Department, Rhodesia Railways, Bulawayo, will retire at the end of this month, and will become the Rhodesia Railways' Agent, Lourenco Marques, with effect from May 11. He will succeed Mr. D. W. Pool, and will also supervise the Beira Sub-Agency.

Mr. W. W. Maxwell, Depot Engineer, Running Division, Metropolitan & Baker-

Mr. Maurice Laing has been appointed an additional member of the Advisory Council, Export Credits Guarantee Department. Mr. Laing is Managing Director of John Laing & Son Limited.

Mr. L. J. Dunnett, C.B., C.M.G., who, as recorded in our February 20 issue, has been appointed Permanent Secretary to the Ministry of Transport & Civil Aviation, was educated at the Edinburgh Aca-



Sir Gilmour Jenkins

Permanent Secretary to the Ministry of Transport & Civil Aviation who is retiring



Mr. L. J. Dunnett

Appointed Permanent Secretary to the Ministry of Transport & Civil Aviation

20 issue, is retiring, served, from 1941 to 1946, as Deputy Director General of the Ministry of War Transport and, in this capacity, had charge of the Shipping side of the Ministry. He was made Permanent Secretary of the Control Office for Germany & Austria in 1946, and, when that office was amalgamated with the Foreign Office in 1947, he became Joint Permanent Under Secretary of State at the Foreign Office. Sir Gilmour Jenkins was appointed Permanent Secretary to the Ministry of Transport in 1947 and, when the Department was merged with the Ministry of Civil Aviation in 1953, he became Permanent Secretary to the combined Ministry. He became a member of the Institute of Transport in 1948, was elected an additional member of Council in 1951, and was President of the Institution during 1954-55.

Mr. Donald Mackenzie has been appointed Superintendent of Operations, St. Lawrence Seaway Authority. He will be responsible to Mr. R. J. Burnside, Director of Operations.

loo lines, London Transport Executive, has been appointed Principal Executive Assistant, with the title of Divisional Engineer "B," in the Department of the Chief Mechanical Engineer (Railways).

INSTITUTION OF RAILWAY SIGNAL ENGINEERS

At the annual general meeting of the Institution, the following Members of Council for 1959 were announced:—

President

Mr. D. G. Shipp.

Vice-Presidents

Mr. W. Owen and Mr. F. G. Hathaway.

Members of Council (Member Class)

Messrs. J. P. Coley, J. S. S. Davis, R. Dell, R. A. Green, H. W. Hadaway, L. J. M. Knotts, B. Reynolds, E. A. Rogers, J. Sulston and A. F. Wigram.

Members of Council (Associate Member Class)

Messrs. B. H. Grose, O. H. Hoffman, N. S. Hurford, M. Le Sueur, A. E. Walker and A. E. Williams.

demy and University College, Oxford. Mr. Dunnett entered the Civil Service, in the Air Ministry, in 1936. In 1945 he transferred to the Ministry of Civil Aviation, being promoted Assistant Secretary, in 1946, and Under Secretary in 1948. In 1951 he transferred to the Ministry of Supply and, in 1953, was promoted to be Deputy Secretary, transferring to the Ministry of Transport & Civil Aviation in 1958. Mr. Dunnett was created C.M.G., in 1948, and C.B. in 1957.

Mr. B. P. H. Dickinson has been appointed Under Secretary, Ministry of Transport & Civil Aviation, and has taken over the Shipping Operation Ports & Planning Group from Mr. W. Graham, who has retired. Mr. C. P. Scott-Malden has been appointed Under Secretary, Road Transport & International Inland Transport Group. He succeeds Mr. J. E. Hampson, whose promotion to be Deputy Secretary (Inland Transport) was recorded in our March 20 issue.



Mr. F. R. Griffith

Appointed Commercial Officer (Freight Research)
Western Region



Mr. W. B. Carter

District Commercial Manager, Derby,
L.M. Region, 1950-59



Mr. F. L. Lambert

Appointed Assistant Civil Engineer,
L. M. Region

Mr. F. R. Griffith, Acting Assistant (Cartage), to the Commercial Officer, Paddington, Western Region, British Railways, who, as recorded in our March 13 issue, has been appointed Commercial Officer (Freight Research), joined the Great Western Railway, in 1922, in the Office of the Superintendent of Road Transport, Paddington. After experience in that office he was appointed District Cartage Representative, Worcester, in 1936. In 1943 he returned to Paddington, as Senior Outdoor Cartage Representative, in the then newly-formed Cartage Control, Chief Goods Manager's Office. During the next seven years Mr. Griffith was concerned mainly with station investigation and was in charge of the development of the Zonal Collection & Delivery Cartage arrangements throughout the region. In 1950 he was appointed Chief Cartage Clerk, Commercial Superintendent's Office, Glasgow, Scottish Region. The following year he became Deputy Assistant for Road Transport, Chief Commercial Manager's Office, Southern Region, at Dorking, and subsequently at Waterloo. Mr. Griffith returned to the Western Region, in 1954, as Assistant District Goods Manager, Paddington, and since October 1958, has been Acting Assistant (Cartage), under the Commercial Officer.

Mr. W. H. McFadzean, Chairman and Managing Director, British Insulated Callender's Cables Limited, has been elected President of the Federation of British Industries. He succeeds Sir Hugh Beaver.

Mr. D. L. Walker, General Secretary, Federation of British Industries, has retired after 42 years' service. He has been elected a Vice-President and has accepted the appointment of Honorary Adviser to the Federation. The following consequential staff changes are announced: In the absence overseas of the Director-General, Mr. P. F. D. Tennant, Overseas Director, the Federation will act in his place, and Mr. W. P. N. Edwards will take charge of British Overseas Fairs Limited, as Managing Director. Mr. J. Gough, Assistant General Secretary, becomes Secretary. Mr. J. Whitehorn, hitherto a member of the General Secretary's Department, becomes Assistant to the Director-General.

Mr. W. B. Carter, M.Inst.T., District Commercial Manager, Derby, London Midland Region, British Railways, who, as recorded in our March 13 issue, has retired, completed nearly 50 years' railway service. Mr. Carter was educated in Melton Mowbray, where his father was Superintendent of the Great Northern & London North Western Railway joint line. He joined the Great Northern Railway in 1909, and, after serving with the L.N.W.R. at Nottingham and Bedworth, became a cadet at Lancaster in 1914. During the 1914-18 war he served as a telegraphist in the R.N.V.R. He returned to the railway, in 1919, and became an outdoor representative, General Superintendent's staff, Manchester, in 1923. Mr. Carter later became Commercial Assistant in the office of the District Commercial Superintendent, and, in 1936, was appointed Assistant District Goods & Passenger Manager, Northampton. He moved, in 1938, to the Chief Commercial Manager's Office, Euston, as Goods Development Assistant. During the 1939-45 war he was Chairman of a number of committees, including the Railway Executive Committee's Wagon Control organisation, and the Liaison Committee with the Ministry of Food. Mr. Carter was appointed District Goods & Passenger Manager at Northampton in 1943, at Derby in 1944, and at Sheffield in 1945. This last appointment was subsequently redesignated District Commercial Manager. Mr. Carter was a Justice of the Peace for the City of Sheffield and a member of the Licensing Justices, and retained these offices when he moved to Derby, in 1950, as District Commercial Manager. He is a past member of the Sheffield Joint Omnibus Committee, and a member of the Nottingham, Derby and Burton-on-Trent Chambers of Commerce. He is a director of the Midland General Omnibus group and a member of the Standing Joint Committee for the East Midlands and Trent Omnibus Companies.

Sir Edward Crowe has retired from the board of English Electric Co. Ltd.

Mr. D. J. Bird, a vice-chairman of Fisons Limited, has retired after 30 years' service with the company.

Mr. F. L. Lambert, Assistant Engineer (Works Maintenance), Paddington, Western Region, British Railways, who, as recorded in our February 27 issue, has been appointed Assistant Civil Engineer, London Midland Region, studied Civil Engineering at University College, London. He graduated, with first class honours, and was awarded the Vernon Harcourt Prize for Civil & Municipal Engineering. Mr. Lambert began his railway career, in 1929, with the former Great Western Railway. He served under the Divisional Docks Engineer, Newport & Cardiff, and the Divisional Engineers at Wolverhampton, Taunton and Gloucester. In 1946 he was appointed Assistant Divisional Engineer, Cardiff, and two years later, transferred to Neath, and subsequently to Cardiff in similar capacities. He was appointed Acting Divisional Engineer, Abergavenny, in 1949, District Engineer, Shrewsbury, in 1951, and District Engineer, Newport, in 1952. Mr. Lambert became Assistant Engineer (Works Maintenance), Paddington, in 1955, the position he now vacates for his present appointment.

Mr. A. J. Orbell, of the Overseas Division, Expandite Limited, is making a business visit to Germany, Holland, Austria and Belgium.

ARGENTINE RAILWAY APPOINTMENTS

The following appointments have been made on the Argentine State Railways:

General San Martin Railway

Mr. E. E. J. N. Massafferro as Chief of the Way & Works Department.

D.F. Sarmiento Railway

Mr. V. N. Gilardoni as Chief of the Way & Works Department.

General Belgrano Railway

Mr. R. J. Pettis as Chief Accountant.
Mr. J. Forns as Chief of the Stores Department.

General Urquiza Railway

Mr. J. Biagosch as Chief of the Supply Department.

General Roca Railway

Mr. A. Capurro as Chief of the Stores Department.

General Mitre Railway

Mr. P. Riordan as Chief of the Stores Department.



Mr. P. F. Grant

Appointed Assistant Regional Accountant,
N.E. Region

Mr. P. F. Grant, Senior Assistant to the Regional Accountant, Western Region, British Railways, who, as recorded in our March 13 issue has been appointed Assistant Regional Accountant, York, Eastern Region, was educated at Stationers' School and London University. Mr. Grant joined the Great Western Railway, in 1921, in the Parcels Audit Office. Five years later he moved to the Chief Accountant's Office where, in 1949, he became Assistant Head of the Ledger Section. He was appointed Assistant to the Chief Accountant in 1952 and, a year later, became Senior Assistant. Since 1954 Mr. Grant has been Chairman of the Western Region Standing Committee on Office Mechanisation and last year organised an exhibition at Paddington, of office machines and appliances.

Mr. J. R. Greenwood, Jr., a director of Craven Brothers (Manchester) Limited, has been appointed Technical Director. Mr. F. W. Green, who, as recorded in our March 27 issue, has joined the board, becomes Works Director. Mr. William Lord continues as Commercial Director of the Company.

We regret to record the death, on March 22, at the age of 93, of Mr. F. A. Ellender, Divisional Operating Superintendent, Dover, Southern Railway, 1923-25. Mr. Ellender began his railway career in 1877. He was appointed a clerk in the Stationmaster's Office, London Bridge, in 1880, being transferred to the Superintendent's Office in 1884. In 1906 he became District Superintendent, Western District, Redhill, which position he held until 1923, when he was appointed Divisional Operating Superintendent, Dover (Eastern Division) following the amalgamation of the London, Brighton and South Coast Railway, the South-Eastern & Chatham Railway and London South-Western Railway Company.

B.T.C. POLICE APPOINTMENTS

Mr. E. C. Brashier, Assistant Chief of Police, Western Police Area, Windsor, covering the Southern and Western Regions, British Railways, has been appointed Chief of Police, North Eastern Area, York. Mr. J. H. Goodier, Divisional Superintendent of Police, North Eastern Area, becomes Assistant Chief of Police, York. Mr. R. J. Booth, Assistant Chief of Police, London Transport Executive has been appointed Chief of Police, Eastern Area, Peterborough.

Mr. S. W. Jesper, Public Relations & Publicity Officer, North Eastern Region, British Railways, has been appointed Assistant to the General Manager.

Mr. P. S. Bennett, formerly Chief Signal & Telecommunications Engineer, North Eastern Railway, India, has been appointed Sales Engineer, Signals, G. D. Peters & Co. Ltd.

Mr. T. R. Earnshaw has been appointed a director of Ferodo Limited, member of the Turner & Newall Group.

Mr. Gordon Heynes has resigned from the board of Modern Engineering Machine Tools Limited and its subsidiary the Linley Engineering Co. Ltd., in order to devote more time to his other business interests.

Mr. E. J. Solvay, of Brussels, will succeed Sir Robert Robinson as President of the Society of Chemical Industry on July 10.

Mr. A. A. Haining has been appointed Sales Manager, Exactor Limited. He was formerly Deputy Sales Manager of Sigmund Pumps Limited.

Mr. W. E. Ogden, Chairman, Delta Metal Co. Ltd., and Mr. Peter Wrightson, a managing director of Head Wrightson & Co. Ltd., have been appointed to the boards of the Iron Trades Employers' Insurance Association and the Iron Trades Mutual Insurance Co. Ltd.

THE INSTITUTION OF LOCOMOTIVE ENGINEERS

The following names have been entered on, or transferred in, the register of Members of the Institution of Locomotive Engineers:—

Members

Mr. A. P. Evans, Deputy Chief Engineer (Mechanical), Crown Agents for Oversea Governments & Administrations.

Mr. D. J. C. Robertson, General Manager, Metropolitan-Cammell Carriage & Wagon Co. Ltd.

Associate Members

Mr. H. E. Gardam, Mechanical Engineer, J. Stone & Co. (Deptford) Ltd.

Mr. N. W. Milligan, Sales Engineer, British Timken Limited.

Mr. D. J. Owens, Shedmaster, Nakuru, East African Railways & Harbours.

Mr. C. A. Smedley, Chief Electrical & Mechanical Engineer's Department, Derby, London Midland Region, British Railways.

Associates

Mr. R. A. R. Hoare, Managing Director & Sales Engineer, Blin Stoye & Co. Ltd., Nairobi.

Mr. C. J. Parton, Project Engineer, Girling, Limited.

Associate Member to Member

Mr. D. Scott, Inspecting Engineer, Crown Agents for Oversea Governments & Administrations.

Graduate to Associate Member

Mr. G. B. Adams, Engineer, Southern Pacific Railroad, U.S.A.

Graduates

Mr. S. Bhattacharya, Assistant Mechanical Engineer, Central Railway, India.

Mr. J. Carson, Traction Machine Designer, General Electric Co. Ltd.

Mr. B. C. Hamer, Assistant Engineer (Mechanical) Crown Agents for Oversea Governments & Administrations.

Mr. E. E. Myers, Traction Machine Designer, General Electric Co. Ltd.

Student to Graduate

Mr. D. C. Blake, Technical Assistant, Electrical Engineer's Department, Eastern Region, British Railways.

Student

Mr. R. Nath, Student Trainee, Metropolitan-Cammell Carriage & Wagon Co. Ltd.



Mr. A. S. Bramworth

Appointed Assistant Mechanical Engineer
(Carriages & Wagons), N.E. Region

Mr. A. S. Bramworth, A.M.I.Mech.E., Carriage & Wagon Works Manager, York, North Eastern Region, British Railways, who, as recorded in our February 27 issue has been appointed Assistant Mechanical Engineer (Carriages & Wagons), began his railway career, in 1921, in the Drawing Offices of the former Great Northern Railway, Doncaster. After experience in the Carriage Works, Doncaster, he served as Assistant to the Works Manager there, from 1933 to 1941, when he moved to the Carriage & Wagon Works, York, in a similar capacity. He was appointed Assistant Carriage Works Manager (New Works), York, in 1945, with special responsibility for new coach construction. He particularly was concerned with the organisation of the new coach building shop and the production of the standard steel coach. In 1945 Mr. Bramworth accompanied a party of railway officers on a tour of the United States of America. In 1951 he was appointed Assistant Carriage & Wagon Works Manager, York, and returned to Doncaster, in 1954, as Carriage & Works Manager, the post he has vacated to take up his present appointment.

Mr. J. Steel, Mr. A. Hallsworth, Mr. A. G. Howe, Mr. R. Cooke and Mr. H. B. Ward have been appointed directors of R. H. Neal & Co. Ltd. Mr. Steel has been elected Chairman.

INSTITUTION OF RAILWAY SIGNAL ENGINEERS

The following names have been entered on, or transferred in, the register of members of the Institution of Railway Signal Engineers:

Member

Mr. J. L. Russell, Chief Engineer, Railway Signals Department, Metropolitan-Vickers Electrical Co. Ltd.

Associates

Mr. W. D. Butterworth, Chairman, Butterworth & Dickinson Ltd.

Mr. F. Wood, Technical Sales Manager, Butterworth & Dickinson Ltd.

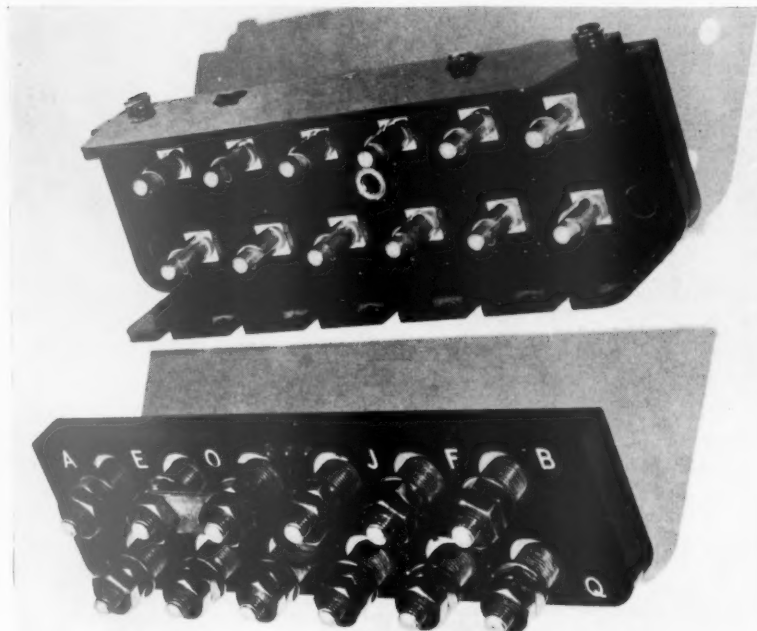
Mr. C. P. Lovemore, Special Class Signaller, Bristol, Western Region, British Railways.

Mr. W. Gillett, District Inspector, Birmingham, Western Region, British Railways.

Associate Member to Member

Mr. P. Lamb, New Works Assistant (Modernisation), Signal Engineer's Office, Scottish Region, British Railways.

NEW EQUIPMENT AND PROCESSES



Plug Coupler

A PLUG coupler set has been designed for the conversion, without modification, of some types of existing searchlight signals fitted with fixed terminals.

Developed to the requirements of Mr. E. G. Brentnall, Signal Engineer of the London Midland Region of British Railways, the set basically consists of a backboard and a plug-in terminal board. The backboard replaces the existing terminal board on the signal movement, and the plug-in terminal board, on which existing signal cable can be terminated, plugs in the backboard.

Construction is of non-ferrous metal and thermosetting plastic. If damaged, individual

metallic parts can be removed from mouldings and replaced. Plug-and-socket connections are silver-plated, and nickel-plated O.B.A. terminal posts at 1-in. centres are provided with lock nuts and washers to B.S.S. 442 in accordance with normal railway signalling practice.

A single captive screw holds the terminal board to the backboard, and a gasket separating the two components prevents the ingress of moisture and dirt. Coding pins are available to prevent wrong connection.

Fitment of these plug couplers to existing signal movements when these are returned to workshops for routine inspection and maintenance gives the advantages of a plug-in searchlight signal technique, including complete safety and speed of changing

signal movements by unskilled labour.

Further details can be obtained from the White Electrical Instrument Co. Ltd., 10, Amwell Street, Rosebery Avenue, London, E.C.1.

Graphitic Tool Steel

AN oil-hardened, graphitic tool steel, known as M.I.C.8, is in production which is claimed to be as free from distortion in heat treatment as are conventional carbon-manganese "non-distorting" steels. Its difference from these steels lies in its higher carbon content.

By careful control of the analysis and metallurgical conditions of processing, part of the carbon is retained in the final product in the form of graphite particles uniformly dispersed throughout the structure. These particles act as a lubricant and considerably improve machineability of the product. They also reduce the tendency to seize, gall, or score.

The new steel is claimed to be ideally suitable for components of intricate shape which have to withstand wear and abrasion. It is produced as rolled or forged bar, forged blanks, and rings.

Further details can be obtained from the English Steel Corporation Limited, River Don Works, Sheffield, 9.

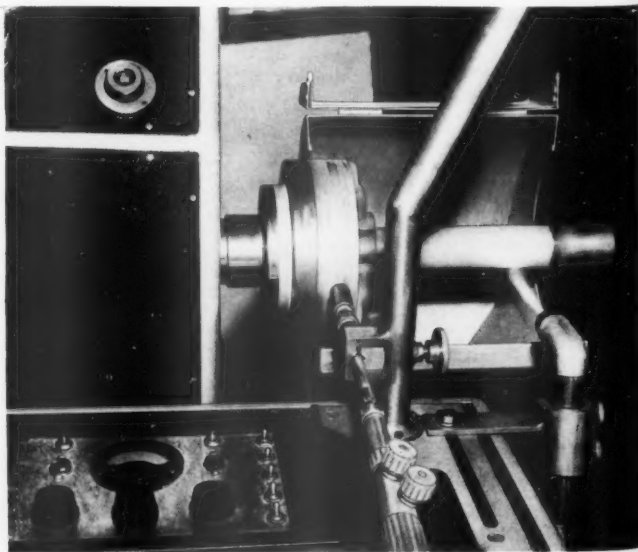
Auto Spray-Fuse Unit

A UNIT has been designed to mechanise the spray-fuse "Stellite" hard-facing process described and illustrated in this section on January 30 this year.

The unit consists of a powered carriage on rollers with spray gun and fusing torch in tandem. A small panel groups the controls. The work-head is self-contained with variable power drive to the chuck and designed for spray-fusing on a production basis.

Operation can be by unskilled labour. The traverse is set by stops, correct gas and powder feeds fixed, and final fusing is controlled by an electric eye which eliminates any chance of error resulting from partial fusing.

The unit can be easily lifted off its tracks



and used with alternative head arrangements to accommodate longer or larger diameters. An outboard bearing can be provided for long shafts.

Further details can be obtained from Deloro Stellite Limited, Highlands Road, Shirley, Solihull, Warwickshire.

Improved Paper Towels

WHITE Hi-Dri paper towels now are available in roll form and individually. The towels, which are an improvement on the manufacturer's previous product, have an abnormally fast absorbency rate and contain the same degree of wet strength as the towels they supersede. Cost remains the same.

Further details can be obtained from Kimberley-Clark Limited, 11, Grosvenor Gardens, London, S.W.1.

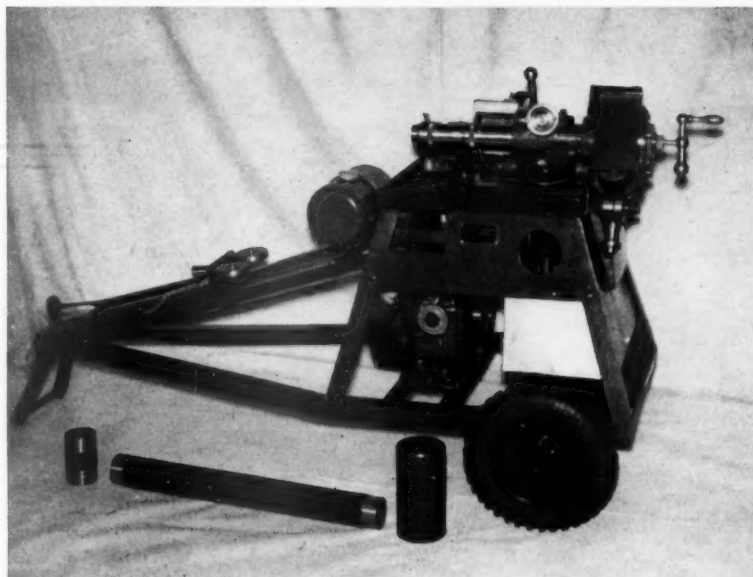
Cathodic Protection

THE Galvion anode is a simple means of preventing corrosion which, standard in the U.S. Navy and Coast Guard Service, now is being manufactured in this country. It is suitable for controlling corrosion in heat exchange equipment such as lubricating oil coolers and refrigeration condensers.

In three sizes, the anode comprises a brass plug with B.S.P. tapered threads and a number of high-purity zinc "bobbins" or elements each with a threaded steel core. The elements thus can be screwed into each other to allow adjustment of length to fit confined space without waste. An interference thread ensures vibration-proof service.

Fitting is simple: the cover of the spaces to be protected is drilled and tapped, after which the tapered plug thread ensures a watertight joint. Sealing compounds are unnecessary. Existing drain plugs often can be used.

Further details can be obtained from the exclusive distributors in the British Commonwealth and some European countries, F. A. Hughes & Co. Ltd., 4, Stanhope Gate, London, W.1.



Pipe Threading Machine

A FULLY-AUTOMATIC pipe-threading machine has been developed which is simple to operate and can be of portable or stand type.

The machine is powered by electric motor or petrol engine. Both types of drive can be fitted on the chassis of the portable model.

Method of operation is simple: the pipe to be screwed is placed on and gripped internally by the work mandrel, the machine is started, and the depth of thread set on a calibrated quadrant. The pipe then moves automatically through the cycle of operation. Threads are formed with abrupt ends and are concentric: this form of thread resists damage through handling and provides uniform strength. Cutting takes place from under the scale on the pipe, thus minimising cutter wear.

Extra attachments can be supplied for chamfering ends of pipes for welding construction with the ends formed square to axis, concentric with bore, and to a feather edge or with a land.

Further details can be obtained from the Spiro Ball Bearing Co. Ltd., Kettering.

Anti-Germ Floor Paint

AN improved version of Glocrete SR floor coating has been developed to reduce health risks arising from concrete floors. These risks include the release into the air of dust particles and the presence and generation of bacteria.

Until now, Glocrete SR has been a synthetic rubber-based floor coating applied by brush, spray gun, or roller. In its new form, the product incorporates a powerful germicide, which is retained throughout the life of the coating and helps to kill germs brought in on the soles of footwear. It is touch dry after 30 min., reaches 60 per cent of the hardness of plate glass after about 10 hr., and maximum hardness (about 85 per cent of plate glass) after some days. Time will depend on temperature conditions. The product can be used in hot, cold, dry, or damp conditions. Coverage on smooth concrete is about 300 sq. ft. per gal. Flash-point is 110 deg. F. The finished coating does not promote combustion.

Finish is semi-gloss and can be obtained

in nine standard colours and in white, black, and aluminium. The paint is non-slip, and will withstand fresh and sea water, acids, alkalies, oils, and fats.

Further details can be obtained from Corrosion Limited, 16, Gloucester Place, London, W.1.

Spark Machining Service

A NEW service offers spark machining for toolwork within the following fields: press tools; moulds; dies for forging, cold heading, and drawing; hot stamping dies; extrusion dies, and tungsten carbide form tools and inserts. The service also covers the removal of broken taps and drills.

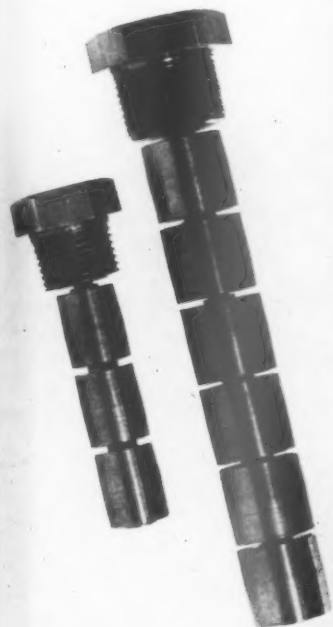
Spark machining is claimed to effect economies because of the following factors: the process is largely automatic; it works on materials in the hardened state so that many heat treatment problems are eliminated; it easily machines hard materials such as tungsten carbide and nimonic alloys; production times for complex and simple shapes are equivalent. In many cases, the process can re-sink dies and rectify tools for further use. Modifications to existing tools in the hardened state can be carried out without tempering or annealing.

Further details can be obtained from the Spark Machining Co. (Laytons) Limited, 23 Newton Street, Birmingham 4.

Visual Flow Indicator

THE K-type liquid flow indicator is an inexpensive and compact version of the Telicator unit. It is designed for use in pipelines and with liquids of temperatures up to 80 deg. C., at high or low pressure, and of almost any viscosity. Length is only 2½ in., and the unit can be completely dismantled for cleaning without breaking pipe connections. A perspex cylinder houses a rotor located by pivots and sprung bearings so that flow is readily revealed. The rotor is so pivoted as to reduce friction and thus minimally affect rate of flow.

Further details can be obtained from Sir W. H. Bailey & Co. Ltd., Albion Works, Patricroft, Manchester, the sole agents and distributors for the manufacturer, Dukes & Briggs Engineering Co. Ltd.



Heavy Locomotive Traverser for East Africa

Movement of locomotives up to 250 tons; provision for conversion from metre to 3 ft. 6 in. gauge



General view showing (right) trolley arm of current collector, and winch on left of machinery housing

A locomotive traverser designed and built for the Nairobi workshops of East African Railways & Harbours by S. H. Heywood & Co. Ltd., Reddish, to the requirements of the Crown Agents for Oversea Governments & Administrations, has a carriage 100 ft. long. The traverser is designed for the movement of locomotives up to 260 tons gross weight. The acceptance test loading of 325 tons was disposed to simulate the axle loading positions of Garratt locomotives used on East African Railways and Harbours.

The weight is 55 tons, loaded speed 100 ft. per min., and unloaded speed 200 ft. per min. The equipment includes a winch for hauling locomotives on and off the table. Provision has been made for the changeover on site from the present metre gauge to 3 ft. 6 in. gauge track if and when this is required.

Structure

The traversing carriage, with machinery housing, is a bolted structure of rolled steel sections mounted on 13 pairs of 26 in. dia. wheels positioned on a wheelbase of 11 ft. 9 in. The two longitudinal rail bearers are I section beams sitting on transverse cross-members. These are made up of two I section beams, with top and bottom plating, straddling each pair of wheels. An extra set of bolt holes is provided in the cross-members to facilitate the movement of the rails on site from metre to 3 ft. 6 in. gauge. Cross-members are underslung from bronze bearing plummer blocks below the double flanged load-carrying wheels. This method of construction requires the minimum depth of pit, the distance between the locomotive and traverser rails being less than 2 ft.

For convenient access the grease nipples for bearing lubrication are piped to the outside framework. Diagonal bracing of inverted T section is fitted between the rails. A substantial double guard rail at each side

extends for the complete length of the carriage. The complete top deck will be timbered on site with 2-in. thick planking.

Machinery Housing

The machinery and control housing is a roofed fabricated structure, centrally positioned and extending over one side. Permanent lighting is fitted in the cab and a portable lamp is provided for machinery inspection. The driving motor is a Lancashire Dynamo & Crypto totally enclosed induction

motor rated at 75 h.p. at 575 r.p.m. Control equipment is by Allen West Ltd., the resistances and circuit breaker being enclosed in sheet steel cubicles. Limit switches prevent overtravel of the carriage and a warning bell operates when the traverser is in motion. Power at 415 V., 3-phase, 50-cycles from overhead cables is supplied through a triple arm collector carried on a tower at one end of the carriage.

From the reduction gear the drive shaft extends at each side, driving all wheels on the control side of the traverser. The shaft is split at a series of muff couplings to facilitate manufacture and simplify servicing.

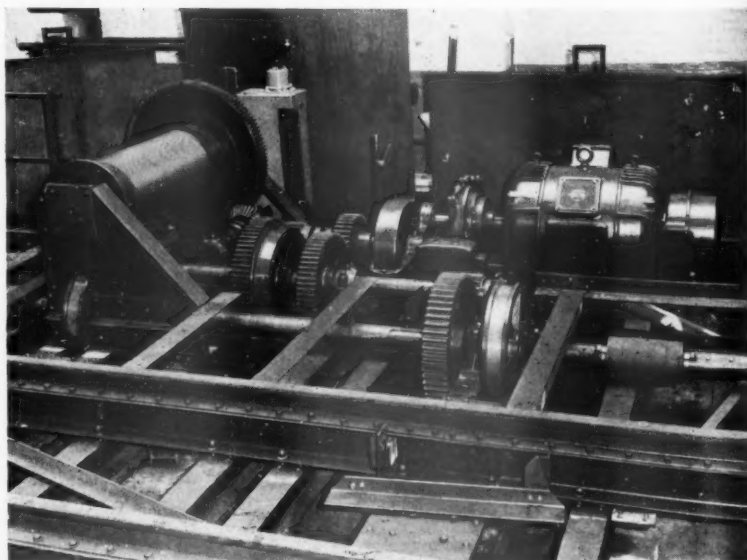
Control Gear

The traverse motor is operated by an Allen West industrial reversing drum type controller. This in conjunction with the electric brake provides a degree of inching control. Accuracy of inching for exact alignment is also facilitated by the provision of a foot-operated mechanical brake. This permits progressive braking as distinct from the instantaneous on/off action of the Holmes electro-magnetic brake. By using a neutral notch on the controller the power is cut off without applying the electric brake, the mechanical brake then being used to stop the traverser exactly in the rail alignment position.

A selector lever alongside the controller operates a dog clutch on the reduction gear layshaft. This enables the high or low speed gear train to be engaged, and the traverse drive to be disconnected when using the winch gear. In the gear cover is a perspex panel which allows the operator to observe the positioning of the dog clutches for engagement.

Winch Gear

Winch gear, driven from the main motor, is provided for the loading on the traverser of locomotives not in steam. Bevel gears take the drive from the reduction gear layshaft to the winch reduction gear. The winch cable, which is 200 ft. long, provides a pull of $3\frac{1}{2}$ tons at 150 ft. per min. Hinged snatch blocks are fitted at each end of the frame. Engagement of the winch drive is by a selector lever and the hauling is governed by the main motor controller.



Driving motor, controller, and reduction gear, with switch on left

Inauguration of Colchester-Clacton-Walton Electrification

British Railways first revenue service on 25kV. a.c. system

Sir Reginald Wilson, Chairman of the Eastern Area Board of the British Transport Commission, officially opened the Colchester-Clacton-Walton electrification, British Railways, Eastern Region, last Monday. The line between Colchester and Clacton, and the branch serving Frinton-on-Sea and Walton-on-the-Naze have been electrified on the overhead contact 25-kV. a.c. system as described elsewhere in this issue.

At Colchester Station, Sir Reginald Wilson welcomed the guests. Those present included Mr. A. F. Pegler, Major-General G. N. Russell, Mr. Jack Tanner, and Sir Henry Willink, Members, Eastern Area Board; and Mr. H. C. Johnson, General Manager, and Mr. W. G. Thorpe, Line Traffic Manager (Great Eastern), British Railways, Eastern Region. Ministry representatives attending included Mr. L. J. Dunnett, Permanent Secretary, and Brigadier C. A. Langley, Chief Inspecting Officer of Railways, Ministry of Transport & Civil Aviation.

Among other guests were Mr. Julian Riddale, M.P. for Harwich, the Mayor of Colchester, the Chairman of the Clacton and Frinton & Walton Urban District Councils, and representatives of other local authorities.

After a tour of the line, luncheon was held at the Royal Hotel, Clacton-on-Sea. Speaking at the luncheon, Sir Reginald Wilson again welcomed the guests. It was, he said, a significant occasion. For the first time in this country, an electric train worked on alternating current at 25,000 V. straight from the grid had been put into revenue service.

The considerable feat of engineering and organisation involved had been carried out speedily, at a cost kept within proper bounds, and without hitch of any kind. The vital point about this new system, as compared with d.c. at only 1,500 V., was that it greatly cheapened the processes of electrification which alone, in the vast and congested traffics around our main cities, would ensure the quality of service required; clean, fast, punctual and comfortable.

The railways, he added, had not only an engineering success which would fascinate the technicians but also an economic and traffic success. The designers and planners of the British Railways Central Staff led by Mr. S. B. Warder who had pressed and pursued the new development with such vision and zeal, and the contractors were to be congratulated on such an excellent job.

The re-born Great Eastern was proud to be first in this field, and there was plenty more under way, quite apart from what was happening on the London, Tilbury & Southend and on the Great Northern. The lines to Enfield, Chingford, Hertford and Bishop's Stortford would be complete next year; the dislocation meantime were both quite formidable. Then there would be the existing sections of electrification, carried out to the pre-war scheme, to convert to the new scheme. This conversion would entail both expense and trouble, but would be well worth it. Finally, there would be the gap to close between Colchester and Chelmsford. At the same time the rest of East Anglia was being converted to diesel traction, an investment which should bring a return of between 40 per cent. and 50 per cent. on the extra capital sunk in the railway. By quite early in the 1960's the Great Eastern ought to be entirely free of steam traction, perhaps the first line to achieve this happy position.

Sir Reginald Wilson emphasised that

though physical modernisation, changed economics, and better public relations were all of them important, in the last resort

everything turned on the energy and quality of the people who worked in the railway and for the railway. What had been needed, he said, was a freeing of the spirit, and a new sense of purpose and hope to match the new railway era which was on the way.

The reply on behalf of the guests was made by Mr. Arnold Quick, Chairman of the North East Essex Area Transport Committee.

New Power Signalbox at Newcastle Central

Replacement of four boxes with Minimum disturbance to traffic during changeover

THE new signalling installation at Newcastle Central Station, North Eastern Region, British Railways, described and illustrated elsewhere in this issue, cost approximately £800,000 and was brought into operation on April 12. Before the opening a tour of inspection of the signalbox, the relay rooms and apparatus rooms was made and a meeting held, at which Mr. J. H. M. True, Traffic Manager, Tyne & Wear Area presided. Mr. T. H. Summerson, Chairman of the North Eastern Area Board, B.T.C. and Mr. H. A. Short, General Manager, North Eastern Region, were unable to be present. Among those who answered questions were:—Mr. N. R. A. Paton, District Operating Superintendent, Newcastle; Mr. J. Natrass, Senior Assistant (Construction) to the Chief Civil Engineer, representing Mr. A. Dean; Mr. A. F. Wigram, Signal Engineer, North Eastern Region; Mr. W. H. Campbell, Stationmaster, Newcastle Central; and Mr. J. N. Stainthorpe, Public Relations Assistant, North Eastern Region.

Little Delay During Changeover

In an area which carries very dense traffic, over some of the busiest intersections in the country, it was inevitable that such a changeover should cause some inconvenience and delay. This was kept to a minimum, and the engineering departments took total possession of the track for only 3½ hr.—7.15 a.m. to 10.45 a.m.

The operation took place at a time when no through expresses between Kings Cross and Edinburgh were in the vicinity. During the period no train movement was possible in the area. Only six main-line passenger services were affected, of these only one London train, the 11.55 p.m. sleeping-car train from Kings Cross the night before, was involved. This was terminated at Durham, passengers completing their journey by special bus service. The Newcastle-Carlisle services were operated to and from Scotswood, four trains being involved. The Newcastle-Middlesbrough and Newcastle-South Shields trains used Gateshead East and West stations and the North-Tyneside electrified-area service was temporarily based on Heaton. In each case a bus service was operated for the convenience of passengers.

Three Stages of Introduction

The changeover on April 12, was undertaken in three stages:—1 a.m.-2 a.m., bay platforms at the east end of the station; 5 a.m. to 7 a.m., bay platforms at the west, and lines towards Carlisle; 7.15 to 10.45, total possession, during which all existing boxes were closed and the new box brought into operation and tested.

Under the new system 62 of the staff, previously employed in four boxes, have been replaced by a total of 23, working in shifts at the new signalbox. No signalman has been made redundant; those released

have been absorbed in other duties. In addition to the dense freight service operating in this industrial area, Newcastle handles a greater number of passengers than any other provincial railway station; 14½ million last year, excluding those who changed trains only. The new system makes a substantial addition to the modern signalling systems in the region at Thirsk, Leeds West, Hull, Northallerton, Darlington, York and Huddersfield.

Long Planning and Wartime Delays

The new installation replaces one of the earliest electro-pneumatic layouts in the country. Resignalling was first considered more than 20 years ago, but the war, and shortage of money and materials in the years immediately after, prevented the scheme being put into practice earlier.

Transport Inquiry Suggested by Road Hauliers

THE Road Haulage Association has suggested an impartial inquiry into all forms of transport in Britain. It would be the first such inquiry since the Royal Commission on Transport reported about 30 years ago.

The proposal is contained in a policy statement published earlier this week and sent to all M.P.s. and trade union officials.

The statement emphasises the R.H.A. opposition to re-nationalisation of the road haulage industry. The suggested inquiry would not be limited to the question of public ownership. The Association maintains that a commission of inquiry could frame "an impartial long-term policy" which would take into account air transport and coastal shipping as well as road and rail transport, and also examine the impact of taxation on the transport industry.

The National Chairman of the R.H.A., Mr. R. N. Ingram, stated on Monday that his industry was "tired of being at the mercy of politicians and of fighting a war on two fronts, against the Labour Party on one side, who wish to eliminate the industry, and against the railways on the other, who are being given every possible assistance, financially and otherwise, in their struggle to compete."

While nationalisation lasted and the stimulus of competition by free-enterprise hauliers was absent, there were constant complaints of inefficiency, delays, and high charges.

Hauliers, he added, had never demanded the suppression of their competitors. If the Labour Party carried out its threat of re-nationalisation, legislation introduced for this purpose might also impose some restriction on the right of the trader to carry his

own goods in his own vehicles under a "C"-licence.

The hauliers' only serious complaint about the present state of affairs, he stated, was that they were taxed far too heavily, whereas their chief competitors, the railways, escaped taxation altogether, notably on the diesel fuel they were using in increasing quantities, and were protected by "lavish subsidies thinly disguised as loans to help them modernise themselves and to mask their deficits."

Construction of Travolator at Bank Station, Southern Region

Work on the "travolator," the two-track moving platform on a gradient of 1 in 7, which will link the platforms of the Bank terminus of the Waterloo & City Line, British Railways, Southern Region, with the L.T.E. Underground station booking hall, was begun in June, 1957, but restrictions on capital expenditure caused the work to be much slowed down from the end of December 1957. In August of last year permission was given to resume. Traffic considerations have necessitated limitations of working hours, and the labour force has been restricted to 80-90 men because of the confined space.

Excavation was started by sinking a vertical shaft in the existing subway leading from Walbrook to Poultry. The plan was to tunnel upwards from this point to the ticket offices and downwards towards the Waterloo & City Line Station. The shaft provided the only practicable access to the work.

First Stage

Workmen operating in gangs have already driven the 16½-ft. dia. cast-iron lined tunnel downwards towards the station platforms. The soil is loaded into skips and either moved along to the shaft and winched up to the street, or taken down to the platform and carried away in special trains.

The tunnel widens to 19 ft. 6 in. near the lower end to house the return mechanism of the travolator and lower still to 29 ft. 6 in. to encompass the existing passenger and siding tunnels. The widening will allow the

approach to Platform 2 to be enlarged. To avoid damage to the tunnel a steel supporting framework has been erected in No. 1 platform tunnel.

The estimated completion date for this part of the work is July, 1959.

Second Stage

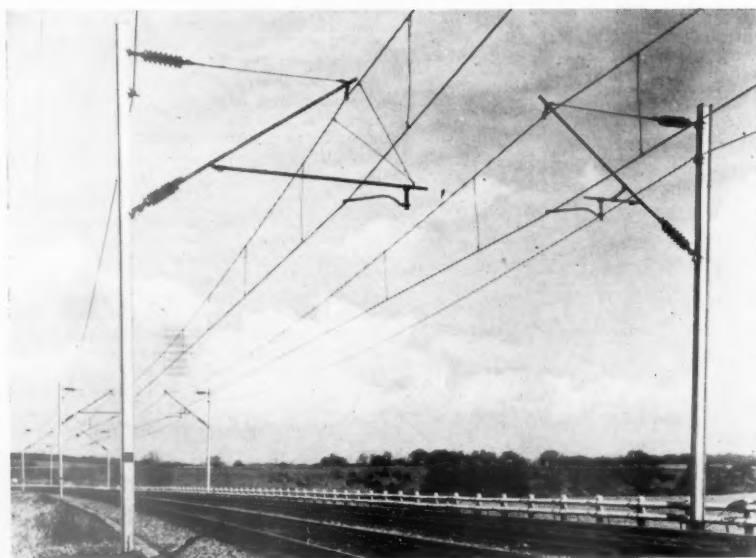
While the lower part of the tunnel is being completed a start will be made in May on driving the upper 16 ft. 6 in. section tunnel. Sewers and other main services have to be diverted. The work is scheduled to be finished by August, 1959. A 4-ft. sewer which ran along Poultry to the Mansion House and down Walbrook has been diverted from the Mansion House along Queen Victoria Street and Bucklersbury. Besides gas and high-pressure water mains, it has been necessary to move a fire main, electricity and telegraph cables and pneumatic tubes and the Exchange Telegraph Company's mains. These diversions involve the sinking of a 24-ft. shaft connecting with a new pipe subway which will carry gas mains and water mains and many other cables. Another part of the work will be lining the whole length of the travolator tunnel with a layer of waterproof material and a finishing surface, and installing lighting.

When the concrete blocks on which the travolator will rest are in position, assembly will begin of the moving pavements. More than 8,000 ft. of structural steel work has to be laid to form the track for 3,904 wheels, to carry 976 platforms, each 40 in. x 16 in., to form two continuous belts. This work will start in October and go on until the beginning of August, 1960.

New Ticket Hall

At the top end of the tunnel just under the surface of the road, a new ticket hall is being built with a connecting subway to Poultry. Beneath the floor a chamber is under construction to house the machinery which will drive the travolator. Some of the walls of the existing passages have to be underpinned. The work cannot be reached from street level partly because of existing main services. The necessary levels have to be reached by underground mining. The roof of the new ticket hall is being built in sections, which involves opening up the road in stages.

Colchester-Clacton-Walton Electrification



Overhead structures and wiring between Colchester and Hythe

All this major constructional work is expected to be complete by April, 1960.

The scheme is being carried out under the general direction of Mr. A. H. Cantrell, Chief Civil Engineer, Southern Region, British Railways. The consulting engineers are Messrs. Mott, Hay & Anderson, and the contractors Mitchell Bros. & Co. Ltd., and the Otis Elevator Co. Ltd.

Parliamentary Notes

Railway Wage Claims

Mr. Peter Thorneycroft (Monmouth-C.), former Chancellor of the Exchequer, in the course of a speech in the debate on the Budget proposals and the economic situation on April 9, said: "If tax reliefs of £300 million and the spending of £750 million more were followed by another round of wage increases of £300 or £400 million unmatched by any quick increase in production... the country might find itself in some very severe difficulties... Last year the claim for wages started in the railway industry. We were told that it was a special case, and it was to be met by economies in the industry. I doubt whether many men would lay their hands on their hearts and say that the increases in wages in the railway industry had been met by economies in the industry. Instead, a thumping increase in overdrift facilities followed shortly after the wage claim had been conceded.

"Now a new demand is made, and if that is granted it will be reflected once more throughout the whole structure of industry, partly in other wages which will go up *pari passu* with railway wages and partly in the added cost of transport which undoubtedly will follow."

Staff and Labour Matters

Railway Workshop Staff Redundancy

A scheme for redundancy and transfer arrangements for railway shopmen was discussed at a meeting of the Railway Shopmen's National Council on Wednesday, April 15. At time of going to press with this column, details of the scheme had not been announced by the British Transport Commission (see also editorial reference this week).

The terms of the settlement were discussed at a meeting of the General Council of the Confederation of Shipbuilding & Engineering Unions on April 9, and it is understood that they are acceptable to the Confederation. The attitude of the N.U.R., which is a party to the machinery of negotiation for railway workshop staff, was not made known before the meeting of the Shopmen's Council on April 15, but in the *Railway Review* of April 10, good progress was claimed to have been made in negotiations, and it was hoped that a settlement would be reached at the next meeting of the council.

Railwaymen's Wage Claim

At a meeting of the Executive Committee of the Transport Salaried Staffs' Association on April 12, the General Secretary of the Association stated that he regretted that the N.U.R. had decided to put in a claim for a substantial increase in pay without consulting the other railway unions, bearing in mind the close relationship which has existed in the past year.

In *The Railway Review* (which is the N.U.R. journal) of April 10, attention is drawn to the fact that average earnings amounting to approximately £12 a week have been severely cut because of economies and fall in traffic and many railwaymen are forced back on the basic rate of pay. The average for this was £9 2s. at the last Census in March, 1958, which was before the 3 per cent increase operative from June 30, 1958.

Contracts and Tenders

B.T.C. contracts for diesel locomotives and rolling stock

Further orders for diesel locomotives and rolling stock for the railway modernisation programme have been placed by the British Transport Commission. They include 37 main-line and nine shunting diesel locomotives, 27 three-car diesel multiple-unit trains, 12 kitchen cars, and 76 sleeping cars. British Railways workshops will build the 37 main-line diesel locomotives and 52 of the sleeping cars.

The 37 main-line diesel-electric locomotives will be of 1,160 h.p., designed for mixed traffic duties, and classified as Type "2". These locomotives are to be erected in British Railways Locomotive Works at Derby, with electric traction equipment supplied by The British Thomson-Houston Co. Ltd., incorporating diesel engines built by Vickers-Armstrong works at Barrow-in-Furness for Sulzer Bros. (London) Ltd. The London Midland Region will have 14 of the locomotives, four are for the North Eastern Region, and 19 for the Scottish Region. The locomotives are expected to be delivered by the end of 1960. The nine diesel shunting locomotives will be of similar design to those already being built by the same firm, with engines of 204 h.p. The nine diesel-shunting locomotives are for the Southern Region.

Trains

The three-car diesel trains will consist of two powered vehicles each with two engines, and a trailer. The North Eastern Region will have 20 of the trains, equipped with Rolls-Royce engines of 180 h.p., for services between the West Riding of Yorkshire and Manchester and Liverpool, where they will be introduced from mid-1960 onward. The other seven three-car trains are for the Scottish Region, and will have 150-h.p. B.U.T. engines. These trains will be allocated to services on delivery.

Of the 76 sleeping cars, 14 will be first-class vehicles, 10 will be composite (first and second class), and the remaining 52 will be the second-class cars to be built by British Railways' Carriage & Wagon Works at Wolverton. The London Midland Region will have 49 of the sleeping cars, 26 are for the Eastern and North Eastern Regions, and one for the Western Region.

The 12 kitchen cars will be of similar design to others now being built by the same firm, and are an extension of previous orders from 18 to 30 vehicles. These cars will be similar to those built for the Festival of Britain trains. They are for the London Midland Region.

Details of the orders are as follow:

The Birmingham Railway Carriage & Wagon Co. Ltd.: 20, three-car sets of diesel multiple-units, each comprising one motor brake open second-class and one motor open composite, each fitted with two 180-h.p. Rolls-Royce engines and B.U.T. final drive, and one trailer open second-class

Metropolitan - Cammell Carriage & Wagon Co. Ltd.: 7, three-car sets of diesel multiple-units each comprising one motor brake open second and one motor open composite each fitted with two 150-h.p. B.U.T. engines, and one trailer open composite; 14, first-class sleeping cars; and 10, composite sleeping cars

Charles Roberts & Co. Ltd.: 12, kitchen cars, Type "KC"

The Drewry Car Co. Ltd.: 9, 0-6-0 204-h.p., diesel-mechanical shunting locomotives

The British Thomson-Houston Co. Ltd.,

37, 1,160-h.p. power equipments for Type "2" main-line diesel-electric locomotives to be built in British Railways Locomotive Works, Derby

British Railways' Carriage & Wagon Works, Wolverton: 52, second-class sleeping cars.

Stewarts and Lloyds Limited has received a contract from Russia for 5,500 tons of boiler and steam pressure tubes to the value of £460,000. This together with a second order for oil well tubing is the largest order received by the company from Russia since before the 1939-45 war.

Siemens & General Electric Railway Signal Co. Ltd., has received an order from South African Railways for 10,000 pairs of Permalin insulating fishplates. The value of the order is some £35,000.

The Ulster Transport Authority has placed an order with Albion Motors Limited, a member of the Leyland group of companies, for 24 under-floor engine light-weight bus chassis. The value of the contract is some £60,000.

Orders totalling £750,000 have been received by Siemens Edison Swan Limited for the supply and installation of cables on the Kent Coast electrification of British Railways, Southern Region.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From India:

100 broad gauge wagons, 20-25 ton capacity for the removal of refuse from Bombay, each to be fitted with a tilting arrangement on either side operated by hydraulic or some other tilting mechanism which is controlled by a suitable device installed in the locomotive.

The issuing authority is the Bombay Municipal Corporation, Cruickshank Road, Bombay. Interested manufacturers should write direct to the Bombay Municipal Corporation, at the same time notifying the United Kingdom Trade Commissioner, P.O. Box 815, Mercantile Bank Building, Mahatma Gandhi Road, Bombay, 1. The Board of Trade reference is ESB/8091/59.

From Pakistan:

Components for fabrication of miscellaneous broad-gauge wagons, including tees, angles, plain black sheets, covered Class "B" electrodes, laminated bearing springs, locomotive side buffers, screw couplings, draw hooks, axles, tyres, and channels.

The issuing authority is the Ministry of Railways & Communications. The tender No. is PRS-59/WAG/1/TDR. Bids should be sent to the Director General (Railways), Railway Division, Ministry of Railways & Communications, Government of Pakistan, Karachi. The closing date is April 27, 1959. Local representation is essential. The Board of Trade reference is ESB/8720/59.

From South Africa:

24 steel tubes, solid drawn to specification No. B.S.806/1954, Class A, 6½ in. dia. × 10 ft. × ¼ in.

36 steel tubes, solid drawn to specification No. B.S. 806/1954, Class A, 7½ in. dia. × 12 ft. × ¼ in.

Alternatively:

24 steel tubes, electric resistance welded to specification No. B.S. 806/1954, Class H, 6½ in. dia. × 10 ft. × ¼ in. 36 steel tubes, electric resistance welded to speci-

cation No. B.S. 806/1954, Class H, 7½ in. dia. × 12 ft. × ¼ in.

150 boiler steam heating stay tubes to S.A.R. drawing CEE/5A. 28, and specification CME 18/1958.

8 items of superheater elements to S.A.R. specification. No. CME. 18/1958 and drawing L-9500.

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, endorsed "Tender No. H.7422 Boiler Tubes & Superheater Elements," should be addressed to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. The closing date is May 1, 1959. Local representation is essential. The Board of Trade reference is ESB/8616/59.

From Victoria:

200 forged axles, to V.R. drawing 10399.1.

200 forged steel axles, to V.R. drawing 10399.2.

The issuing authority is the Victorian Railways. The tender No. is 61,413. Bids should be sent to the Secretary, Victorian Railways, Melbourne, C.I. The closing date is April 29, 1959. The Board of Trade reference is ESB/8697/59.

From Sudan:

500 rolled steel tyres for locomotive tender wheels.

The issuing authority is the Sudan Railways Stores Department. The tender No. is 1925. Bids should be addressed to the Controller of Stores, Sudan Railways, Atbara. The closing date is May 13, 1959. Prices should be quoted on both f.o.b. and c.i.f. Port Sudan basis and tenders should be valid for one month from the closing date. The Board of Trade reference is ESB/8747/59.

Further details regarding the above tender, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

The Brazilian National Railways Department has called for tenders for the supply of 2,000 metre-gauge steel freight wagons. The tender requirement consists of 700 42-ton covered wagons, 700 42-ton flat wagons, 400 42-ton gondola wagons, 100 60-ton flat wagons, and 100 33-ton covered wagons.

The Special Register Information Service, Export Services Branch, Board of Trade, reports that the closing date of the call for tenders from Portuguese East Africa for spares for locomotives, reported in our issue of March 13, 1959, has been postponed to May 4, 1959.

ENGLISH ELECTRIC CO. LTD. AT BRITISH TRADE FAIR, LISBON.—A model of a 3,000-h.p. a.c. electric locomotive and sub-station demonstrating the ability of the English Electric Co. Ltd. to design, construct, and install complete railway electrification schemes will be among exhibits of that company at the British Trade Fair at Lisbon on May 29-June 14. Other locomotive models will be a 1,000 h.p. diesel-electric mixed-traffic locomotive as delivered to Rede Ferroviária do Nordeste, Brazil, in 1954, and a 1,500 h.p. diesel-electric locomotive as delivered to the Malayan Railway in 1957. An impression of the range and magnitude of English Electric achievements will be presented by a mural 13 ft. long and 7 ft. 6 in. high of the five methods of electric power generation for which the company produces prime movers—steam, water turbine, oil, and nuclear power.

Notes and News

B.I.C.C. Bournemouth Depot, New Telephone Number.—The telephone number of British Insulated Callender's Cables Limited, Bournemouth Depot, has been altered to Bournemouth 36223.

Northern Aluminium Co. Ltd. Branch in New Zealand.—A new branch of its aluminium fabricating industry is to be established in New Zealand by the Northern Aluminium Co. Ltd., of London, a wholly-owned subsidiary of Aluminium Limited of Canada. The primary aluminium will be supplied from Canada and the project, costing about £2,000,000 will be financed almost entirely by the two above-mentioned companies. Products will include aluminium sheet and foil for vehicle bodies and wire cable for electric power transmission.

Channel Tunnel Investigation.—Investigations into possible routes for the Channel Tunnel are being resumed immediately by a British firm commissioned by the Channel Tunnel Study Group to obtain specimens of rock from depths as much as 200 ft. below the sea-bed. The object is to confirm the 1958 geophysical survey made at sea by an American Company using electronic equipment. Although the survey, to be completed this summer, shows remarkable agreement with a French survey made in the last century, it is felt necessary to make an additional check by obtaining actual soil samples from boreholes. These boreholes will be sunk from a floating craft by the Central Laboratory of George Wimpey & Co. Ltd.

Saddle Tank Locomotive Burning Wool-Grease Fuel.—A standard-gauge 0-4-0 saddle tank shunting locomotive designed for burning recovered wool grease in the firebox, has been supplied by Hudswell, Clarke & Co. Ltd., to work on the Esholt sewage works sidings of Bradford Corporation, Yorkshire. The wool-grease fuel is recovered from sewage and has a calorific value of 17,750 B.T.U. per lb. It is fed by Holden liquid-fuel burning equipment. The locomotive has two 14-in. outside

cylinders with a stroke of 22 in. Working pressure is 160 lb. per sq. in. The weight, fully loaded, is 28½ tons, and the tractive effort is 13,100 lb. at 75 per cent boiler pressure and 13,860 lb. at 85 per cent.

Permanent Way Institution: Summer Convention.—The 75th anniversary convention of the Permanent Way Institution will be held in London from June 6 to 11. The annual summer general meeting will be held on June 9 at the Institution of Civil Engineers, Great George Street, Westminster, S.W.1, at 10 a.m., when the chair will be taken by the President, Mr. C. E. Dunton. At the conclusion of the business agenda Mr. Dunton will give a paper entitled "Wheels and Rails," illustrated with lantern slides.

High Carbon Bright Steel.—A revised British Standard publication, B.S. 1407: 1959, high carbon bright steel (silver steel), introduces a simplified list of standard sizes for round bars, and contains an additional list of sizes for square bars. Requirements for material and for quality are identical to those in the previous edition. The material is usually referred to as silver steel as used for general purposes. The requirements deal with the process of manufacture, chemical composition, and tolerances on sizes. The specified lengths are: 12 in., 13 in., 3 ft., 6 ft., and 1 and 2 m. An appendix lists a full range of the available sizes in both rounds and squares. Copies, price 4s., can be obtained from British Standards House, 2, Park Street, London, W.1.

Lister Blackstone Rail Traction Limited.—At the Engineering, Marine, Welding, & Nuclear Energy Exhibition at Olympia, London, opened yesterday and continuing until April 30, Lister Blackstone Rail Traction Limited is exhibiting a Lister Blackstone ERS 12T 1,100-h.p. 12-cylinder twin-crank-shaft rail-traction diesel engine of the type fitted in the Explorer mixed-traffic locomotive, described in our February 20 issue. Also on show is an industrial locomotive with 0-4-0 wheel arrangement weighing 7 tons and powered by a 60-h.p. Lister 6-

cylinder engine with hydrostatic transmission. This has a starting tractive effort of 4,000 lb. at 25 per cent adhesion equivalent to a haul of 175 tons on the level with a maximum speed of 12-14 m.p.h.

Road Casualties in February.—The number of people killed on the roads in Britain during February was 372. The total for all casualties was 16,527. Compared with February, 1958, these figures show an increase of 4 in the deaths, but a decrease in the total of 1,206. The Road Research Laboratory estimate that traffic on main roads was 13 per cent heavier than in February of last year.

Institute of Materials Handling Conference.—The first international conference of the Institute of Materials Handling at the Waldorf Hotel, London, will be held on May 6-8. The conference will be opened by Sir Edward Beddington-Behrens. Subjects for discussion include: the role of containers and pallets in international transport. The India and Millwall Docks of the Port of London Authority, and British Road Services depots are among a choice of 12 industrial visits to enable the latest practices to be inspected. The annual banquet of the Institute will be held at the Waldorf Hotel, W.C.2, on May 8. Further details may be obtained from the Conference Office, 42 Manchester Street, London, W.1, telephone, Hun. 2080.

North British Locomotive Co. Ltd.—To meet the immediate needs of the North British Locomotive Co. Ltd. in financing a £14,000,000 order book, the Treasury has agreed to lend £1,750,000, the General Electric Co. Ltd. £500,000, and the Clydesdale & North of Scotland Bank is to give facilities up to a limit of £1,500,000. Mr. T. A. Crowe, the Chairman of North British Locomotive Co. Ltd., has stated that the company is gradually surmounting the many problems which have arisen from the complete change-over from steam to diesel. The link with the General Electric Co. Ltd. should pave the way to a broadening of the business, so that in the years ahead the company will not be so dependent on one industry.

Western Region Prize Essay Scheme for Schools.—To stimulate interest in travel, British Railways, Western Region, has evolved a scheme for showing travel films in schools as part of the curriculum. Prizes given by the Region for the best essays on the subject screened are tickets from the nearest Western Region station to any other station which the winners may choose on British Railways. The number of schools which so far have co-operated in the scheme is 31, and the number of prize winners, out of a total audience of 6,132 is 81 to date. Marking of essays is by the school authorities, and the best in each age group receives a ticket as prize. British Transport films shown have included "Heart of England," "West Country Journey" and "Capital Visit."

New Cargo Vessel for Southern Region Channel Islands Service.—Lady Warter, wife of Sir Philip Warter, Chairman, Southern Area Board, British Railways, on April 13, launched mv. *Elk*, the first of two twin-screw cargo vessels, which Brooke Marine Limited is constructing for British Railways, Southern Region. The vessel was designed in conjunction with the British Transport Commission consultants, Messrs. Burness, Corlett & Partners. The length is 258 ft. overall, moulded breadth 32 ft., tonnage approximately 1,000, and designed speed 14 knots. Propulsion is by two 900-h.p. Sulzer engines.



Shunting locomotive burning recovered wool grease, built for Bradford Corporation Sewage Works by Hudswell, Clarke & Co., Ltd.

Special designed for rapid cargo handling, in bulk or by pallets, the ship can carry a considerable number of containers, and has facilities for the carriage of cattle. Accommodation for crew is in two-berth, and for officers in single cabins. Echo-sounding apparatus, radar, radio-telephones and so on are being fitted. It is intended that both the *Elk* and her sister ship, *Moose*, which is to be launched shortly, will replace the *Haslemere*, *Ringwood* and *Whitstable* on the Channel Islands Service, and will be based at Southampton.

English Electric Co. Ltd. Office at Middlesbrough.—A new sub-office of the English Electric Co. Ltd. has been opened at 14, Albert Road, Middlesbrough, telephone Middlesbrough 44346/7.

I.R.S.E. Awards.—Awards for the best two papers printed and read before the Institution of Railway Signal Engineers in London, during 1958, have been made to Mr. R. Dell for his paper "Automatic junction working and route setting by programme" and to Dr. A. Rosen for his paper "Interference in railway lineside telephone cable circuits from 25kV 50 c/s traction systems." These papers were considered, by the Council of the Institution, of equal merit, and the first and second prizes are shared equally.

David Brown Corporation Limited U.S. Interest.—An affiliation is proposed between the David Brown Corporation Limited of London, and Foote Bros. Gear and Machine Corporation, of Chicago. Subject to the approval of Foote Bros. stockholders of a reclassification of the company's capital stock at a meeting on May 6, the David Brown Corporation Limited will acquire a substantial minority interest in the American concern. It will be represented on the Board of Foote Bros. by Mr. David Brown, chairman of David Brown Corporation Limited, and Mr. Allan Avison.

Cattle Reception Improvements at Holyhead.—Newly rebuilt lairage accommodation at Holyhead for the reception of fully accredited attested cattle from Ireland, passing under the requirements of the Bovine Tuberculosis Eradication Scheme, has been completed by British Railways, London Midland Region. The first large shipment arrived from Dublin by British Railways cargo vessel on April 13. Some 450 accredited cattle can now be handled at the premises which include a cattle trap for the speedy inspection and marking of cattle with the least disturbance in accordance with Government regulations. Mobile high-pressure disinfectant spraying equipment has been provided.

British Standards for Flameproof Clothing.—The three new British Standards, B.S.1547: 1959, flameproof industrial clothing (materials and design), B.S.3119:1959, method of test for flameproof materials, and B.S.3120: 1959, performance requirements of materials for flameproof clothing, align the standards for performance and testing of flameproof materials with the new standard for materials of low flammability in B.S.3121. The whole subject of flameproof clothing previously was dealt with in B.S.1547, which is now confined to flameproof industrial clothing and makes reference to the two new companion standards for performance and testing of the material. B.S.3120 specifies requirements with which the materials themselves must comply before they can be called flameproof. B.S.3119 specifies the method of test and the testing conditions. Copies, price 3s. each, may be obtained from the British Standards Institution, 2, Park Street, London, W.1.

British Timken Limited.—The United States parent company of British Timken Limited, Timken Roller Bearing Company of Canton, Ohio, has made an offer worth over £10,000,000 to gain 100 per cent control. It is offering 83s. 9d. for each of the 2,337,500 £1 shares that it does not already control out of the total of 5,000,000. Also the United States company is arranging to repay at 12½ per cent premium British Timken's £1,000,000 of four per cent preference capital.

Swedish Ball Bearing Company.—Aktiebolaget Separator, the Swedish Ball Bearing Company, announces a net profit of Kr.10.9 million for 1958, against Kr.10.1 million for the preceding year. A dividend of Kr.12 per share, as for 1957, is recommended on the capital increased to Kr.10.8 million (Kr.9.8 million).

Norwegian Railways' Modernisation Plan.—A 10-year plan for modernisation of the State Railways has been laid before the Norwegian Parliament by the Government. The cost of the plan is estimated at £120 million. The scheme provides for a Central Station in Oslo and continuation of most of the existing electrification projects. New lines already under construction would be completed, but no new lines would be begun.

Bulk Cement Handling in Scottish Regions.—Bulk cement handling facilities in British Railways, Scottish Region, were described in our June 27, 1958, issue, in connection with movement of cement to West Kilbride, for the atomic power station being built at Hunterston, Ayrshire. The Region is now working in conjunction with the Cement Marketing Co. Ltd., in movement of cement for the Forth Road Bridge, for which the latter company is supplying cement for the South Queensferry side. The quantity required will be more than 12,000 tons over about two years. The Cement Marketing Co. Ltd., has erected a 200-ton silo at the South Leith Depot. The Scottish Region is

providing 20-ton air-discharge wagons. Some 400-500 tons of cement in bulk is to be railed weekly from one of the Blue Circle cement works to South Leith. Discharge from the Pres-flo wagons will be by diesel compressor pump into pressurised road vehicles or into the silo, as necessary, at one ton a min. The silo was built by Eonit Engineering Co. Ltd.

A. Reyrolle Limited Results.—An unchanged total ordinary dividend of 17½ per cent is announced by A. Reyrolle Limited, with a maintained final payment of 11 per cent. Net profits for 1958 were virtually the same as for the previous year, at £1,358,257 compared with £1,353,086. Tax amounted to £1,353,724, against £1,409,188.

Vokes Limited.—The directors of Vokes Limited have announced that the accounting date of the group is to be changed from June 30 to March, so that the next accounts will cover only nine months. Also there is to be a one-for-one capitalisation issue. An interim dividend of 7½ per cent will be paid on April 30 on the present capital, and a final dividend of 8½ per cent for the period is forecast on the proposed larger capital, payable when the accounts are available. For the following year to March 31, 1960, the total dividend is expected to be 12½ per cent entirely on the new capital.

Quiz Competition for Enginemen.—A team of six from St. Margarets, Edinburgh, British Railways Scottish Region, with 65½ points, beat the West Auckland, Durham, team, North Eastern Region, by one point in the final of the 1959 British Railways inter-Regional competition for enginemen. The winners are being given a week's educational visit to one of the Continental railways. Teams from 54 motive power depots in all Regions competed. The final was held on April 9 at the British Transport Commission headquarters, London. Mr. J. Ratter, Member of the Commission, presented the challenge shield to the winning team. The questions tested knowledge of steam and diesel locomotives, the principles of fuel combustion, and railway operating rules.



200-ton silo for bulk unloading of cement from rail at South Queensferry, Scottish Region

Blaw Knox Limited.—A final dividend of 20 per cent by Blaw Knox Limited makes the total for 1958 30 per cent as for the previous year. The net profit subject to audit is £105,931 (£107,772), after tax £120,439 (£124,954).

Delta Metal Co. Ltd.—The Chairman of Delta Metal Co. Ltd., Mr. W. E. Ogden, states that, given reasonable trading conditions, this year should be as successful as 1958. The group trading profit for 1958 rose from £1,858,714 to £2,720,021, and the profit before tax from £1,533,107 to £2,114,909.

Yale & Towne Manufacturing Company.—A new service depot has been opened at Wilson Place, Nerston Industrial Estate, East Kilbride, Lanarkshire, by the Yale & Towne Manufacturing Company to give immediate spare parts service, and overhaul facilities to Yale equipment users in Scottish industrial areas. The telephone number is East Kilbride 20241.

British Wagon Co. Ltd.—Mr. R. A. Dyson, the Chairman of British Wagon Co. Ltd., has told shareholders that the proposed one-for-one capitalisation issue is desirable both to bring the paid-up capital more into line with their stake in the company, and to provide a broader basis for further borrowing. In 1958, there was a substantial increase in the business transacted and in the profits earned. Deferred income increased from £1,190,195 to £1,534,432. The borrowing powers of the directors are to be increased from £12,000,000 to £20,000,000.

Closure of Two London Midland Region Stations.—British Railways, London Midland Region, has announced that Bell Busk Station, between Lancaster and Skipton, and Amptill Station between Luton and Bedford, will be closed from May 4, 1959. Passengers should book to Hellfield or Gargrave for Bell Busk Station, and Flitwick for Amptill Station. There are buses operating in both areas. Parcels and passenger train merchandise for Bell Busk will be dealt with at Skipton, and for Amptill at Flitwick. Alternative arrangements will also be made for freight traffic.

British Standard for Drawing Pins.—A new British Standard, B.S.1677:1959, draughtsmen's drawing pins, covers three sizes of drawing pins, $\frac{1}{2}$ in., $\frac{3}{4}$ in., and $\frac{7}{8}$ in. All three are in wide current use on drawing boards. Two types of pin are specified: Type B.S. 1, in which the pin is screwed into the head; and Type B.S. 2, in which the pin is gripped firmly by swaging or peening only. Copies, price 3s., may be obtained from the British Standards Institution, 2, Park Street, London, W.1.

Davies & Metcalfe Limited Results.—The net profit for 1958 by Davies & Metcalfe Limited is £30,211 compared with £28,580 for 1957. The dividend is 20 per cent as before. The meeting will be at Romiley, Cheshire on April 27.

The Pressed Steel Co. Ltd.—An increase of nearly £500,000 in the net profit of the Pressed Steel Co. Ltd., for 1958, £4,360,377, compared with £3,508,051 for the previous year, has enabled the dividend to be raised by 5 per cent to 25 per cent with a final of $17\frac{1}{2}$ per cent. The 1956 dividend was 15 per cent. The meeting will be held in London on May 27.

Films on Lubrication.—Two industrial films were shown recently by the Mobil Oil Co., Ltd., to an invited audience at the British Council Cinema, London. The first, "Lubricants With Care," showed recommended delivery procedures, oil storage practices, issue of lubricants by modern dispensing equipment, and the operation of various oil reclamation plants. The second film, "Compressor Lubrication," dealt with air

and gas compressors. It explained the need for particular characteristics in lubricating oil. Animated diagrams showed how lubricants are applied to the main types of compressor. The film stressed the importance of preventive maintenance of compressors.

Forthcoming Meetings

April 23 (Thu.).—Model Railway Club, at Caxton Hall, Westminster, S.W.1, at 7.45 p.m. A talk by Mr. A. Hancox, "The North London Railway."

April 24 (Fri.).—Crewe Pupils' and Apprentices' Association dinner at the Royal Automobile Club, London, S.W.1.

April 25 (Sat.).—Permanent Way Institution, East Anglian Section, at Yarmouth, at 2.15 p.m. Paper on "Narrow-gauge railways of Italy," illustrated, by Mr. R. Shephard.

April 28 (Tue.).—Institution of Civil Engineers, at Great George Street, London, S.W.1, at 5.30 p.m. Paper on "A project for extending the Nigerian Railway into Bornu Province," by Sir Ralf Emerson, Chairman, Nigerian Railway Corporation.

April 28 (Tue.).—Railway Correspondence and Travel Society, East Midlands Branch at the N.C.S. Guild Room, Toll Street, Nottingham, at 7.30 p.m. Paper on "Locomotives of the L.N.W.R.," illustrated, by Dr. W. A. Tuplin.

May 1 (Fri.).—The Railway Club, at the Royal Scottish Corporation, Fetter Lane, E.C.4, at 7 p.m. Paper on "The Golden age of light railways," by Mr. C. F. Klapper.

Railway Stock Market

The big gains in stock markets which followed the Budget tax cuts gave way later to considerable profit-taking, but buyers re-appeared and business has been on a substantial scale. The cut in income tax means that dividend payments are worth more to shareholders, and it is assumed that the tax reductions will induce companies to be less conservative in their dividend policy. Reason why stock markets have not held best levels was continued uncertainty about the general election, though the prevailing view in the City is that the general election is unlikely until the autumn.

With attention centred on industrial shares because of the Budget, there was only very limited interest in foreign rails. Where changed, they showed small irregular movements with no particular significance. Antofagasta ordinary stock firmed up from 12 to 12 $\frac{1}{2}$, but the preference stock eased from 26 a week ago to 25 $\frac{1}{2}$. The 4 per cent perpetual debentures strengthened to 35 $\frac{1}{2}$, but the 5 per cent (Bolivia) debentures lost a point at 85 $\frac{1}{2}$.

Costa Rica ordinary stock remained at 13 $\frac{1}{2}$ and Chilean Northern 5 per cent debentures at 55. San Paulo Railway 3s. units eased from 2s. to 1s. 10 $\frac{1}{2}$ d. and Brazil Railway bonds from 6 $\frac{1}{2}$ to 6. United of Havana second income stock remained at 6 and the consolidated stock at 1. Mexican Central "A" bearer debentures held firm at 57 $\frac{1}{2}$ d.

Canadian Pacific eased from 55 $\frac{1}{2}$ to 55 $\frac{1}{2}$; the 4 per cent debentures were 65 $\frac{1}{2}$ and the 4 per cent preference stock 54 $\frac{1}{2}$. White Pass shares changed hands around 513 $\frac{1}{2}$.

Buyers have been in evidence for Nyasaland Railways shares, which compared with a week ago, rose from 13s. to 13s. 9d.; the 3 $\frac{1}{2}$ per cent debentures remained at 61 $\frac{1}{2}$. Elsewhere, Emu Bay Railway 5 per cent irredeemable debentures were dealt in at

26 $\frac{1}{2}$. West of India Portuguese capital stock was maintained at 105 $\frac{1}{2}$ with the 5 per cent debentures 91 $\frac{1}{2}$.

The shares of locomotive builders and engineers became slightly more active, but movements have been small. G. D. Peters strengthened afresh from 27s. to 27s. 6d. and Westinghouse Brake attracted again and rose further from 43s. to 43s. 6d. while Gloucester Wagon 10s. shares at 18s. 1 $\frac{1}{2}$ d. and Wagon Repairs 5s. shares at 9s. 1 $\frac{1}{2}$ d. were virtually the same as a week ago. On the other hand, Birmingham Wagon receded from 20s. 3d. to 19s. 6d. and Beyer Peacock 5s. shares were less firm at 7s. 10 $\frac{1}{2}$ d. but Charles Roberts 5s. shares strengthened from 11s. 3d. to 11s. 6d.

Edgar Allen shares held steady at 31s. 3d., Broom & Wade 5s. shares were 16s. and Holman 10s. shares 18s. 1 $\frac{1}{2}$ d. A good feature has been a rise from 57s. 3d. a week ago to 59s. in Associated Electrical, and B.I. Cables were prominent with an advance from 49s. 3d. to 52s. 9d. in response to the good impression created by the results and the unexpected increase in the dividend. Automatic Telephone shares rose 1s. 9d. to 80s., Babcock & Wilcox held their rise to 53s. and T. W. Ward strengthened afresh to 86s. 9d.

Pressed Steel 5s. shares were firm at 26s. 6d. on the dividend increased from 20 per cent to 25 per cent; profits, before tax, rose from £1,527,121 to a record £2,017,598. English Electric shares were 64s. 3d., General Electric at 34s. 6d. more than held last week's gain, while Crompton Parkinson 5s. shares have been firm at 13s. 6d. Dowty Group 10s. shares were well maintained at 42s. 1 $\frac{1}{2}$ d. Elsewhere, there was some profit-taking in British Timken after their recent advance, the price coming back from 73s. to 69s. 9d. Vickers eased from 33s. to 32s. 6d. while Stone-Platt Industries advanced further from 45s. 4 $\frac{1}{2}$ d. to 46s. 6d. Steels remained active but fluctuated, and only small gains were shown on balance, United Steel improving from 31s. to 31s. 6d. and Stewarts & Lloyds from 30s. to 30s. 3d.

OFFICIAL NOTICES

BRITISH RAILWAYS: NORTH EASTERN REGION PUBLIC RELATIONS & PUBLICITY OFFICER. Applications are invited for senior established post of Public Relations & Publicity Officer, North Eastern Region, British Railways, York; salary commensurate with responsibility; superannuation scheme.

All round public relations and publicity experience at a high level essential. Responsibilities include development of information service through all publicity media.

Applications in writing, giving age, education, experience and qualifications, should be addressed to the General Manager, British Railways, North Eastern Region, York.

TECHNICAL MANAGER required for Division of a large Public Company, engaged in the light and medium heavy engineering industry, to be responsible for all Engineering, including Design and Development, and to represent the Division in the technical field.

Candidates should have considerable experience of design and manufacture in the Railway Rolling Stock Industry in a Senior Executive capacity, coupled with substantial engineering qualifications.

The appointment, which is a senior one, arises from continued expansion of the Company and offers considerable opportunities. Remuneration will be commensurate with the scope of the position, governed by experience and qualifications.

Applications, with full details of curriculum vitae and salaries earned will be studied at Board level and may be made in strict confidence to Box No. 2444, c/o Charles Barker & Sons Ltd., Gateway House, London, E.C.4.

RAILWAY TURNTABLE. For sale, Muntz type standard gauge turntable, 65 ft. long, carrying capacity 150 tons approx. **WATER CRANE.** 3,000 gallon Water Crane. **TURNOUTS.** Twenty 1 in 8 Turnouts in 75 lb. F.B. rail; interchangeable to suit L.H. or R.H. All these items are in excellent condition. Apply Eagle Construction Co. Ltd., East Common Lane, Scunthorpe, Lincs. Phone: 4513.

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